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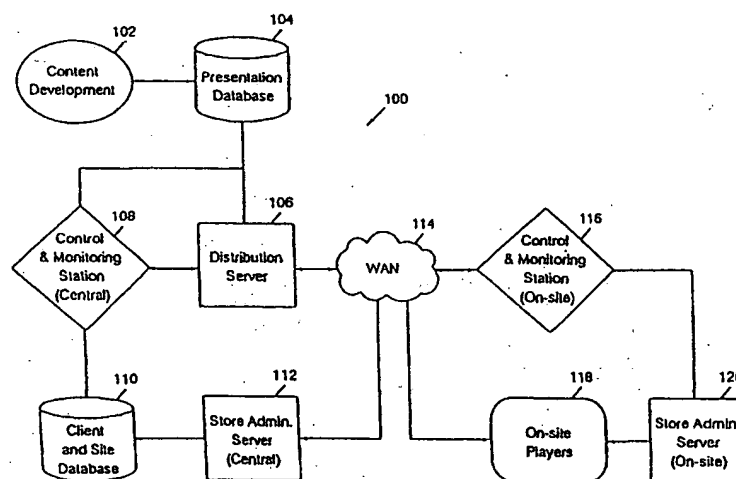
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(54) Title: SYSTEMS, METHODS AND COMPUTER PROGRAM PRODUCTS FOR GENERATING DIGITAL MULTIMEDIA STORE DISPLAYS AND MENU BOARDS



## (57) Abstract

Digital multimedia presentations are assembled at a central location for stores. Start and end times are assigned. The digital multimedia presentations and the assigned start and end times are transmitted to and received at the stores. The received presentations are stored in digital multimedia players at the stores. Upon occurrence of an assigned start time, the associated digital multimedia presentation is automatically played in the store until the assigned end time. If a presentation is not available at a particular time, a generic default presentation is played. The presentations may be played at assigned start and end times until an expiration date, after which it is automatically deleted from the digital multimedia player. The digital multimedia presentations may be customized at the central location and/or at the stores. The present invention is particularly applicable for generating menu boards for an enterprise which includes multiple sites.

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SYSTEMS, METHODS AND COMPUTER PROGRAM PRODUCTS  
FOR GENERATING DIGITAL MULTIMEDIA  
STORE DISPLAYS AND MENU BOARDS

Field of the Invention

This invention relates to information processing systems, methods and computer program products, and more particularly to store systems, methods and computer program products.

Background of the Invention

Information processing systems, methods and computer program products are being increasingly used in the store environment. For example, information processing systems may be used for inventory control, point-of-sale and accounting systems. Stores may include wholesale or retail stores or any other consumer environment such as movie theaters, airports, shopping malls, arenas, and other such venues. Information processing systems continue to play an increasing role at restaurant chains such as "fast food" restaurant chains which include a large number of restaurant sites. Information processing control of distribution, promotion and other activities is increasingly being used to coordinate the large number of restaurant sites.

With the advent of the personal computer, multimedia presentations are also increasingly being

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used in commercial and consumer environments. Multimedia presentations may include text, graphics, audio and full motion digital video which are integrated into a single presentation.

5           Attempts have been made to use multimedia presentations in the store environment. See, for example, U.S. Patent 5,412,416 to Nemirofsky entitled "Video Media Distribution Network Apparatus and Method" and International Application WO 96/08113 to Cho et al.  
10           entitled "Point of Purchase Video Distribution System". See also the publication entitled "POS Goes Multimedia: Retailers Test New Applications" by Fox, Chain Store Age Executive, Vol. 71, No. 2, February, 1995, pp. 43-  
15           46. However, notwithstanding these attempts, there continues to be a need for improved systems, methods and computer program products for generating store displays.

#### Summary of the Invention

20           The present invention includes methods, systems and computer program products for generating store displays for a plurality of stores. Digital multimedia presentations are assembled at a central location for the plurality of stores. Start and end times are assigned to the digital multimedia  
25           presentations for the stores. The digital multimedia presentations and the assigned start and end times are transmitted to the plurality of stores and are received at the stores. The received digital multimedia presentations are stored in digital multimedia players  
30           at the stores. Upon occurrence of an assigned start time, the associated stored received digital multimedia presentation is automatically played on a digital multimedia display in the store until occurrence of the assigned end time for the associated digital multimedia  
35           presentation. Thus, digital networks and digital

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multimedia presentations are used to effectively generate digital multimedia store presentations.

5 In a preferred embodiment of the present invention, a digital multimedia default presentation is also generated at the central location for the plurality of stores. The digital multimedia default presentation is free of (i.e. it does not include) a start time and an end time. The digital multimedia default presentation is transmitted, received and  
10 stored in the digital multimedia players at the stores. At the stores, it is detected that an assigned end time for an associated digital multimedia presentation has occurred, and that a start time for a second digital multimedia presentation does not correspond to the  
15 assigned end time. Upon this occurrence, the digital multimedia default presentation is automatically played so that the digital multimedia display always plays a multimedia presentation. Similarly, it may be detected at the store that termination of a digital multimedia  
20 presentation has occurred prior to the assigned end time, for example because of an error or other reason. In this case, the digital multimedia default presentation is automatically played on the digital multimedia display in the store.

25 The digital multimedia presentations also preferably include start and end dates which are also transmitted and received at the stores. The received digital multimedia presentation is automatically played on the digital multimedia display in the store upon  
30 occurrence of an assigned start time which is between the assigned start date and the assigned end date. After expiration of the assigned end date, the stored digital multimedia presentation is deleted from the digital multimedia player at the store. Thus, digital  
35 multimedia presentations may be played at predetermined times during the day, for a period of days between an assigned start day and end day. Thereafter, the

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presentation is deleted to make room for other presentations on the digital multimedia player.

The digital multimedia presentations are preferably customized for selected ones of the plurality of stores. When customized, a store identification may be provided and the customized digital multimedia presentations are transmitted to the identified stores.

Customization may be provided at the central location by accepting customization data related to the selected ones of the stores. Alternatively, customization may take place at the individual store by providing customized data, for example concerning prices or sales periods at the stores. Customization may also take place both at the central location and at the stores. A feedback mechanism may also be provided wherein effectiveness of the digital multimedia presentation in the store is measured, for example by analyzing sales data. If an indication is received that the digital multimedia presentation is not effective, a new multimedia presentation may be assembled, transmitted, received, stored and automatically played.

Transmission may take place using a wide area network such as a wired wide area network, a wireless network and the internet. The digital multimedia presentation may be presented on a display which is a virtual display comprising a plurality of display devices arranged in an array. According to another aspect of the invention, customer inputs may be accepted to provide interactive digital multimedia presentations at the store.

The present invention is particularly applicable for generating menu boards for an enterprise such as a restaurant chain, which includes a plurality of sites such as restaurant sites. As is well known to those having skill in the art, menu boards are

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generally placed above a counter in a restaurant and include an identification of items sold at the particular restaurant, as well as the associated prices. A time of day may also be identified, for example for a breakfast menu. Special promotions may be identified, such as "value meals" or other limited-time promotions. The present invention allows replacement of the static menu board with a digital multimedia menu board which can be displayed on a virtual display including a row or array of multimedia monitors.

Digital multimedia menu presentations are assembled at a central location. The presentations include a menu of items which are sold at the restaurant chain and digital multimedia presentations for selected ones of the menu items to advertise promotions. The digital multimedia presentations may include audio, text, graphics and full motion digital video.

For each restaurant site, a restaurant site specific menu is generated which comprises selected ones of the items from the menu of items which are sold at the restaurant chain, the associated prices for the restaurant site, and the restaurant-specific multimedia advertisements, to form a customized digital multimedia menu board for each restaurant site, including menu items offered at the restaurant site, the associated prices and the multimedia advertisements concerning the menu items. Thus, for example, a nationwide restaurant chain may be running different promotions and may be selling different items in different parts of the country. The prices will also generally vary from store to store. Thus, for each restaurant site, a site-specific menu is generated.

The customized digital multimedia presentation is then transmitted from the central location to the associated restaurant site and is



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received at the associated restaurant site. The received customized digital multimedia presentation is then stored in a digital multimedia player at the restaurant site. The customized digital multimedia presentation is then automatically played on a digital multimedia menu board at the restaurant site, so that the digital multimedia menu board indicates the menu items and prices and advertisements for items which are presently being sold at the restaurant site.

According to another aspect of the present invention, start and end times are assigned for the digital multimedia presentations for each restaurant site, and the start and end times are transmitted and received at the restaurant site. Then, the customized digital multimedia presentation is automatically played from the assigned start time until the assigned end time. Thus, for example, a digital multimedia menu board for breakfast may only be played from 7:00AM-11:00AM, and this time can vary from day to day. Thereafter, a lunch menu board may be displayed.

According to another aspect of the present invention, a digital multimedia default menu presentation is also generated, transmitted, received and stored. Then, if an assigned end time for a digital multimedia presentation occurs and a start time for a second digital multimedia menu presentation is not present, the digital multimedia default menu presentation may be played. Accordingly, for example, if a new lunch menu has not been received, a default lunch menu may be displayed until the new lunch menu is received. Thus, it can be ensured that the digital multimedia menu board never displays a blank menu board. Similarly, if a digital multimedia menu presentation terminates prematurely due to an error or other occurrence, the default menu board may be played so that the digital multimedia menu board is never blank.

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According to another aspect of the present invention, start and end dates are provided for the digital multimedia menu presentations for the restaurant sites. The start and end dates may be provided to accommodate price changes, new promotions and new items which are added to the menu board. Thus, the digital multimedia menu presentations are presented between the assigned start and end times and between the start and end dates. After the end date, the stored digital multimedia menu presentation is deleted from the digital multimedia player at the restaurant site, to free up storage space.

According to another aspect of the invention, customization data may also be provided for the restaurant site. For example, a customized list of items which are sold at the restaurant site may be provided centrally, but the prices may be entered at the individual restaurant site. Similarly, local promotions to meet competitive prices may also be entered at the local sites.

The digital multimedia menu boards may also be tied to a point-of-sale system at the restaurant site, which measures effectiveness of the promotions which are advertised on the menu boards. Thus, if point-of-sale data indicates that the promotions on the menu board are not being effective, this indication may be provided to the central location and new digital multimedia presentations may be assembled and transmitted to the store to provide a new presentation. The presentations on the menu board or on another kiosk in the store may also be made interactive by responding to customer inputs to provide interactive presentations. Multilingual presentations may also be provided.

### Brief Description of the Drawings

Figure 1 is an overall block diagram of systems, methods and computer program products for generating digital multimedia store displays and menu boards according to the invention.

Figures 2A and 2B are flowcharts illustrating an operational overview of systems, methods and computer program products for generating store displays for a plurality of stores according to the present invention.

Figure 3 is a detailed block diagram of the control and monitoring station of Figure 1.

Figure 4 illustrates an entity relationship conceptual model of the client and site database of Figure 1.

Figure 5 illustrates an entity relationship conceptual model of the presentation tracking database of Figure 3.

Figures 6A and 6B illustrate examples of wide area networks of Figure 1.

Figure 7 illustrates a local area network which may be used at the central location of Figure 1.

Figure 8 illustrates an example of an on-site local area network for Figure 1.

Figure 9 is a block diagram of the on-site players of Figure 1.

Figure 10 is a block diagram of the on-site control and monitoring station of Figure 1.

Figure 11 illustrates a fast-food restaurant including a digital multimedia menu board according to the present invention.

Figure 12 illustrates a digital multimedia interactive kiosk according to the present invention.

### Detailed Description of Preferred Embodiments

The present invention now will be described more fully hereinafter with reference to the

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accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

#### 10 Overview

Referring now to Figure 1, an overall block diagram of systems, methods and computer program products for generating digital multimedia store displays and menu boards according to the invention is illustrated. As shown in Figure 1, system 100 may be used to distribute, manage, monitor and display digital multimedia presentations in store environments. The digital multimedia presentations may serve a promotional, operational, or "edutainment" (education/entertainment) function. By using digital multimedia presentations, the present invention can leverage the strengths of network distribution including rapid updating, improved process management, dynamic integration of multiple data sources and robust control over remote playback.

Promotional applications may include in-store marketing efforts which are targeted to motivate desired consumer behavior by increasing consumer awareness. For example, digital multimedia presentations may highlight product availability or specific in-store incentives to motivate product purchase. Operational presentations may include features which are central to the functioning of the store, for example a fast food restaurant menu board. Finally, edutainment applications may be used to provide computer-based activities to consumers or store

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personnel that are either educational or entertainment, or both. Examples may include staff training, motivational messaging or computer games. Regardless of the content, the digital multimedia presentations may be assembled, transmitted, received and played at the stores using the same software and hardware infrastructure, described below.

Accordingly, the present invention may be used to generate revenue, reduce costs, and/or increase consumer traffic. As a revenue generator, the promotional applications may create a new in-store medium that can be sponsored or cofunded by participating companies, similar to television advertisements. The operational applications can reduce the amount of materials and labor which are currently expended for the same tasks. Finally, the edutainment applications can be the basis for an in-store experience that motivates consumers to visit a given store or motivates staff retention and effectiveness.

It will be understood that the digital multimedia presentations may be passive or interactive. The digital multimedia presentations may respond to direct consumer input. For example, a promotional application can be presented on a touch-screen device which changes the type of information displayed in response to consumer selections.

Figure 1 is a block diagram of systems, methods and computer program products for generating store displays according to the present invention. As shown in Figure 1, system 100 includes an apparatus and/or a step for assembling at a central location, digital multimedia presentations for the plurality of stores. This apparatus or step is indicated in Figure 1 as "content development" 102. Digital multimedia presentations which are developed are stored in a presentation database 104 at the central location and

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are staged for distribution through a distribution server 106 at the central location. Applications are distributed through a wide area network (WAN) 114 to on-site players 118. Information about the digital multimedia presentations in the stores may be transmitted back to the distribution server 106 where it is stored in a client and site database 110.

Continuing with the description of Figure 1, digital multimedia presentations which are assembled during content development 102, may include full motion digital video, still images, computer-generated animation, print prepress files, text and/or audio. The content is assembled into a complete digital multimedia presentation and stored in the presentation database 104. The details of assembling digital multimedia presentations will be described below. All approved digital multimedia presentations in the presentation database 104 are available for scheduling and transmission to the on-site players 118, as will be described in detail below.

The central control and monitoring station 108 enables a system operator to collect data from the client and site database 110 and the presentation database 104 in order to create digital multimedia presentation packages for each site. The digital multimedia presentation for each site may be determined in part by specific instructions or data from the various sites, which may be entered at the on-site control and monitoring station 116 and which is received and processed through the store administration server (central) 112. The central control and monitoring station 108 issues commands to distribute the assembled digital multimedia presentations from the presentation database 104 via the distribution server 106.

Digital multimedia presentations are distributed from the central location, to the plurality

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of stores, using a wide area network (WAN) 114. Thus, the blocks of Figure 1 to the left of WAN 114 are at a central location, whereas the blocks to the right of WAN 114 are at an individual store. It will be understood that the central location may include a plurality of discrete sites which act as distribution points for the stores. Similarly, the various components for the stores need not be physically located in the stores, except for the digital multimedia display of the on-site players 118. Rather, these components may be included at another location associated with the store. The distribution of the digital multimedia presentations from the central locations to the stores may be managed by large multimedia file distribution software such as CreativePartner™, which is marketed by emotion Incorporated, Palo Alto, California.

At the stores, the digital multimedia presentations may be received, disassembled and stored in the on-site players 118. Client instructions or other on-site data such as point-of-sale information can be integrated into the digital multimedia presentations on the on-site players 118. Relevant data about the digital multimedia presentations and the state of the on-site players 118 may be recorded and transmitted to the distribution server 106. A system operator at the control and monitoring station 108 can view this data.

After a predetermined end date, the digital multimedia presentation is retired and replaced by another presentation which is delivered to the on-site player 118 as described above. Alternatively, a site-specific default presentation, which is always present on each on-site player 118, may be used. The default presentation is designed to be appropriate for on-site display at any time for a given client.

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The system 100 is preferably designed to allow most digital multimedia presentations to play without any action on the part of on-site personnel. However, there may be some functions for which it is useful to provide control and management tools to the store manager, such as selecting from among multiple implementations of a particular digital multimedia presentation, or setting the store hours or schedule for a particular store. This on-site customization may be obtained using the on-site control and monitoring station 116 and the store administration server 120, as will be described below.

#### Operational Overview

Referring now to Figures 2A and 2B, an operational overview of systems, methods and computer program products for generating store displays for a plurality of stores will be described.

As will be appreciated by one of skill in the art, the present invention may be embodied as a method, data processing system and/or computer program product. Accordingly, the present invention may take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects. Furthermore, the present invention may take the form of a computer program product on a computer-readable storage medium having computer-readable program code means embodied in the medium. Any suitable computer-readable medium may be utilized including hard disks, CD-ROMs, optical storage devices, or magnetic storage devices.

The present invention is described below with reference to flowchart illustrations of methods, apparatus (systems) and computer program products. It will be understood that each block of the flowchart illustrations, and combinations of blocks in the flowchart illustrations, can be implemented by computer



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program instructions. These computer program instructions may be loaded onto a computer or other programmable data processing apparatus to produce a machine, such that the instructions which execute on the computer or other programmable data processing apparatus create means for implementing the functions specified in the flowchart block or blocks. These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means which implement the function specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart block or blocks.

Referring now to Figures 2A and 2B, store displays 200 are generated by first developing or assembling generic digital multimedia presentations for multiple stores (Block 202). For example, when the store displays are menu boards for a restaurant chain, digital multimedia menu presentations including a menu of items which are sold at the restaurant and digital multimedia presentations such as advertisements for selected ones of the menu items are generated. These digital multimedia presentations are generally developed by creative professionals at advertising agencies or clients. After a generic presentation is assembled, it is released to distribution and stored in

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the presentation database 104 of Figure 1 where it awaits assembly and distribution.

At Block 204, the digital multimedia presentations are customized for individual stores. Customization may take place by generating for each restaurant site, a restaurant site-specific menu comprising selected ones of the items from the menu of items which are sold at the restaurant chain, the associated prices for the restaurant site, and restaurant-specific multimedia advertisements, to form a customized digital multimedia menu board for each restaurant site including menu items offered at the restaurant site, the associated prices, and multimedia advertisements concerning the menu items.

It will be understood that customization may take place independent of store input. However, preferably, instructions or data gathered from the store sites may impact the presentation customization at Block 204. Thus, presentations are preferably customized using the client and site database 110 at the control and monitoring station 108 (Figure 1). The data in the client and site database may be obtained from the store administration server 110 at the store via the store administration server at the central location 112. It will also be understood that additional customization may take place at the stores, as will be described below.

In addition to customization, at Block 206, start and end times and start and end dates are assigned for the customized multimedia presentations. The start and end dates may indicate start and end dates for a particular menu including special products and/or prices. Start and end times may indicate when in the day a specific menu is displayed, for example breakfast, lunch and dinner menus and/or weekend or weekday menus.

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At Block 208, a default digital multimedia presentation is also developed or generated. The default digital multimedia presentation preferably includes generic material for the site which may be displayed in the absence of a customized digital multimedia presentation. Absence of a customized digital multimedia presentation may take place because of an error or because it is desired to display the default digital multimedia presentation.

At Block 212, the digital multimedia presentation packages are assembled for each store. At Block 214, the digital multimedia packages are queued for distribution to the individual stores using the distribution server 106 and wide area network 114 of Figure 1. At Block 216, the digital multimedia packages are transmitted over the WAN 114 and received at the store 216. The received customized digital multimedia presentations are stored at the associated store at Block 218.

At Block 222, further customization may be applied to the presentation. In particular, the on-site store administration server 120 of Figure 1 may be used to provide further customization of the digital multimedia presentation. For example, the playing hours may be modified and prices may be changed. If alternative digital multimedia presentations are stored, one may be selected for presentation at the store. It will be understood that central customization and on-site customization may be used to optimize overall network resources and efficiency. It will also be understood that on-site customization may occur dynamically as the digital multimedia program is played.

Referring to Blocks 226-248, the customized digital multimedia presentations are then automatically played on the on-site player, such as a digital multimedia menu board at the associated restaurant

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site, so that the digital multimedia menu board indicates the menu items and prices, and advertisements for items which are presently being sold at the restaurant site. The appropriate digital multimedia presentation is played between an assigned start and end time and an assigned start and end date.

In particular, the presentations may abut each other in a serial fashion, with a succeeding presentation beginning at the end of a preceding presentation. In other instances, the valid periods for presentations may overlap in several ways. For example, a week-long special promotion presentation may supersede a quarterly seasonal presentation. For that week, the relative start dates are compared, with a preference for the presentation with the most recent start date.

Also, the start and end times which divide a day into periods may be related to a day profile which allows for several different ways of dividing days. For example, a weekend day may have a distinct set of periods from a weekday. More preferably, there is a hierarchy of preferred matching of day profiles which determines what set of time periods are in effect for a given day. These preferred matching profiles may be determined by the manner in which a date is specified. For example, a fully specified date such as 3/17/1997 may have priority over a partially specified date such as 12/25, which itself may have a preference over a day of the week such as Thursday, which itself may have preference over a weekday versus weekend specification.

Accordingly, as shown at Block 226, when the player computer is started, or if the current time is a boundary between sales periods, then at Block 232, a candidate digital multimedia presentation is selected for playback. Candidate digital multimedia presentations are identified as those presentations with an assigned start date greater than or equal to

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the current date and with an assigned start time which falls within the current sales period. If more than one candidate presentation is available, then the candidate with the most recent or greatest assigned start date is started at Block 234. If no candidate presentations are available from Block 232, then the default digital multimedia presentation is started at Block 228.

Having started an appropriate digital multimedia presentation, control returns to Block 226. Until the next sales period boundary or player computer start-up, the player computer storage is periodically checked for outdated digital multimedia presentations beginning at Block 244. If the assigned end date of any digital multimedia presentation is less than, i.e. before, the current date, then the expired presentation is moved to the "outdated" directory at Block 246. If there are no such presentations, then at Block 236 a check is made to determine whether the available storage capacity of the player computer has fallen below a configurable threshold. When the storage capacity falls below that threshold, then the contents of the "outdated" directory are purged to make room for new digital multimedia presentations.

It will be understood that control is periodically passed through Block 238, where a test is made to determine that there is an appropriate digital multimedia presentation displayed. If that test indicates any error in the presentation playback, then the default digital multimedia presentation is displayed at Block 228.

#### Central Control and Monitoring Station

A detailed operational explanation of control and monitoring station 108 (Figure 1) will now be described in connection with Figure 3. As shown in Figure 3, the control and monitoring station 108

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includes control and monitoring software which may be accessed by a system operator to manage the client and site database 110, prepare digital multimedia presentation packages for distribution and track system status and history.

The presentation database 104 is maintained and populated by the content process described in connection with Figure 1. The control and monitoring station 108 accesses the presentation database 104 to identify the digital multimedia presentations which are available for distribution when an operator creates a distribution package.

The client and site database 110 contains information about various enterprises related to the store business, including but not limited to contact and site information and information about the on-site player configuration and installation.

Figure 4 illustrates an Entity-Relationship conceptual model of the client and site database 110. The modeling of databases using entity relationships was first described by Chen. An in-depth presentation of the Entity-Relationship approach may be found in an article by Teorey et al. entitled "*A Logical Design Methodology for Relational Databases Using the Extended Entity-Relationship Model*", published by ACM Computing Surveys, Vol. 18, No. 2, June 1986, the disclosure of which is hereby incorporated herein by reference.

As shown in Figure 4, the client and site database conceptual model represents entities and relationships, implemented in a relational database, which the control and monitoring station 108 manipulates. Enterprise entities can be an advertising agency or its clients, vendors or partners. Alternatively, enterprise entities may be the chain or restaurant chain. As shown in Figure 4, an enterprise owns sites and employs contacts (people) who occupy one or more offices provided by an enterprise site.

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Enterprises may also define regions which allow many sites to be represented by a convenient shorthand notation.

Continuing with the description of Figure 4, a player is a computer configured with a particular set of monitors at a known site. It will be understood that enterprises, contacts, computers, monitors, computer configurations and display configurations can each exist in the database independent of other entities. Thus, they are independent entities. In contrast, regions, sites, offices and players only exist in relation to one or more independent entities. As such, they are shown as "dependent" entities.

Accordingly, in order to assemble a package of digital multimedia presentations for the plurality of stores, an operator at the control and monitoring station 108 selects one or more programs from the presentation database 104, specifies destination sites from the client and site database 110 and schedules the package start and expiration dates. The information that comprises the package is stored in the presentation tracking database 302. Packages are queued for distribution to on-site players using the CreativePartner agent 304. Other multimedia distribution packages may also be employed. The CreativePartner agent 304 copies the package files to on-site players 118 via the distribution server 106 which is connected a wide area network (WAN) 114, as will be described below.

Information such as on-site player operating status and the currently displayed multimedia presentation can also be provided from the on-site players 118 via the distribution server 106 and the CreativePartner agent 304, back to the control and monitoring station 108 to be incorporated into the presentation tracking database 302. For example, a particular digital multimedia presentation may have

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several implementations. An on-site manager may have the option of selecting one of several implementations. The actual digital multimedia presentation which is selected at any given site can be monitored from the control and monitoring station 108 using the presentation tracking database 302. With appropriate interfaces to client point-of-sale data, this data can also be analyzed to monitor program effectiveness with respect to sales and to generate new digital multimedia presentations if a current presentation is not effective. Figure 5 describes an Entity-Relationship conceptual model of the presentation tracking database 302.

#### Local and Wide Area Networks

Figures 6A and 6B illustrate two examples of wide area networks 114 of Figure 1. It will be understood that many other examples of wide area networks may be used. As shown in Figures 6A and 6B, the central location may include a distribution server 106 for the central local area network 602. An ISDN/FR/ATM router 604 may be used to route messages to one or more wide area networks 114. Client routers 606 may be used to interface local area networks 608 for each site.

Figure 7 illustrates a local area network which may be used at a central location to develop, store and queue digital multimedia presentations. It will be understood that many other local area networks can be used. A plurality of content development stations 702 are shown, as well as a database server 704 to serve the presentation database and the client and site database.

Figure 8 illustrates an example of an on-site local area network which may be used at each of the stores. As shown, a plurality of on-site players 118 and a store administration station 120 may be included.



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The functions of an on-site player and store administration server may be combined into a single unit 802. Other on-site devices 804 such as point-of-sale devices may be included in the local area network.

5 In Figure 8, two types of digital multimedia displays are shown. A kiosk 806 is shown including two separate displays therein. The displays may also be tiled to form a single virtual display. A second on-site player 810 is shown with a five-display  
10 operational menu board.

#### On-Site Players

Referring now to Figure 9, operational details of on-site players 118 (Figure 1) will now be described. The on-site player includes a  
15 CreativePartner agent 902, monitor software 904, cron software 906, movie mover software 908 and master player software 912. Each of Blocks 902, 904, 906, 908 and 912 may represent a single software process executing on the player computer. Preferably, each  
20 player 118 includes a complete set of the player software to manage its operation.

The player software is responsible for receiving digital multimedia presentation packages, verifying package content, processing packages to  
25 schedule presentations and carry out utility maintenance, displaying scheduled presentations, and deleting expired presentations. Player software also monitors the state of the system, with regard to processes and programs that are currently running,  
30 reports status to the central monitoring system 108, and may intervene automatically for certain simple error conditions. Initial implementation of the player software may be targeted for Macintosh OS, but the individual components can be portable to other  
35 operating systems.

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The descriptions of the player software components below make reference to the player's directory structure:

```

5      HD:  Player:
           Drop Box:  file packages arrive in the drop box
           Schedule:  holds cron, monitor, log & schedule files
           Movies:    subdirs hold cast/movie (CXT, DXR) files
10      Waiting:     movies not yet schedulable
           Now Playing: copy of the one movie now playing
           Playable:   all currently valid movies and casts
           Outdated:   expired movies/casts (deletable)
           Default:    one movie suitable to play anytime

```

The CreativePartner Agent 902 is the gateway to the network for the player software. The monitor 904 registers with the CreativePartner Agent 902 to receive notification of package arrival. The monitor 904 also interfaces with the CreativePartner Agent 902 to upload system status reports to the central monitoring system 108.

When the monitor 904 is notified of a package arrival, the package is verified and processed, or an error report is generated if the package cannot be verified. A package includes a set of files which may include presentations, constituent media files, and utility programs with any associated data files. A package preferably includes a package description file, or PKG file, which details the file set and includes presentation scheduling information.

The PKG file format may be a simple, extensible, line-oriented text format. PKG files may be generated automatically by the central control software, but may be hand-edited for testing or exceptional circumstances. Below is a sample PKG file:

```

35      : Just in case we hand-edit these, any lines containing
           : colon characters that aren't recognized are ignored.
           : Any line with no colons is assumed to be a content-file
           : name (no leading/trailing whitespace in filenames).
           run: util00 HD:Player:Movies:outdated
40      start date: 1/15/97 00:00:00
           expire date: 2/15/97 00:00:00
           dayparts: *
           files:
           VALENTINE 97.DXR
           HEARTS 97.CXT
45      : This 'run' command happens after content files are
           : processed, the other one runs before processing.
           run: util00 HD:Evince:Movies:Waiting

```

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: A simple checksum for security/validation  
checksum: 0xFF7C02A8

Packages are processed by monitor 904 as follows:

5

Package is validated, if files missing or checksum fails, generate error report.

If package is OK, then:

10

- Launch pre-run utilities
- Move content files to 'Waiting' area
- Modify crontab/schedule as needed
- Launch post-run utilities
- Delete PKG file (if no other PKG files, clean dir, too)
- Log entry: files listing, PKG file name

15

Cron 906 may utilize a proven, robust UNIX utility which has been ported to most common operating environments. Cron 906 is driven by a standard format text file, called the 'crontab'. It is especially suited for scheduling repetitive tasks at fixed times. The player software system also uses cron 906 to schedule program changes that occur due to start date and expiration date arrival. Below is a sample crontab file:

25

```
// The fields of a crontab entry are:
// minute hour monthday month weekday user command...
45 3 * * * nobody reboot
00 4 * * * nobody timesync
15 4 * * * nobody disclean
```

30

```
0 0 15 1 * nobody moviemover "USPS VAL97.PKG"
0 0 15 2 * nobody moviemover "USPS VAL97.PKG"
```

When the monitor 904 processes a package containing start and expire data directives, it makes entries in the crontab that correspond to those dates, which cause cron 906 to invoke the movie mover 908.

35

The movie mover 908 manages file moves from Waiting to Playable, Playable to Outdated, selects a movie for Now Playing, and removes entries from the crontab as they are completed. It is also invoked at system startup and by the monitor 904 whenever a package is processed.

40

The movie mover 908 uses a movie schedule file to determine its actions. If a different program is selected for Now Playing, then the movie mover 908 signals the master player 912 to synchronize the

-25-

program movie changeover. Below is a sample movie schedule file:

5           01/15/97 00:00:00 playable \* HEARTS 97.CXT  
          01/15/97 00:00:00 playable \* VALENTINE 97.DXR  
          01/15/97 00:00:00 cleantab \* USPS VAL97.PKG  
          02/15/97 00:00:00 outdated \* VALENTINE 97.DXR  
          02/15/97 00:00:00 outdated \* HEARTS 97.CXT  
          02/15/97 00:00:00 cleantab \* USPS VAL97.PKG

10           The master player 912 may be a custom  
Macromedia Director™ or other multimedia projector  
which implements the framework for program playback.  
The major components of that framework are a 'Send  
Pulse' routine, and routines which synchronize the  
changeover from one program to another. The 'Send  
15   Pulse' routine makes a timestamped entry in the monitor  
904 status log, which the monitor can then use to  
verify that a valid program is running. If the monitor  
904 fails to receive a pulse from the master player  
912, it schedules the default presentation for  
20   immediate playback and generates an error report. The  
master player 912 generally has one presentation 914  
playing. The presentation 914 may be a Macromedia  
Director movie which is displayed in a subwindow of the  
master player process. In other words, the  
25   presentation 914 is preferably not itself a projector  
(self-running movie).

Together, the processes of the on-site player  
118 ensure that there is always a valid promotional  
message displayed, manage presentation scheduling and  
30   expiration, report status information, and provide an  
extensible infrastructure for remotely managing the  
playback system without requiring intervention by on-  
site personnel.

#### Store Administration Servers (Central and On-Site)

35           Referring now to Figure 10, operational  
details for the central store administration server  
(112, Figure 1) and the on-site store administration  
server (120, Figure 1), will now be described. Although

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the present invention preferably allows many digital multimedia presentations to be executed without any action on the part of on-site personnel, there are some functions for which it may be useful to provide control and management tools to the store manager.

For example, some presentations may have more than one implementation, which allows the store manager to select which presentation to execute at a particular site. Presentations may also have optional controls, especially in the case of operational presentations such as a menu board, which provide for proper configuration at each site. A schedule of store opening, closing, and division of a day into differing periods may also be used in the automated presentation playback process. Since this schedule is likely to vary by location, the store manager can use the administration software to modify the schedule from the default for the client enterprise. The administration software can also provide help, training and troubleshooting with respect to the on-site operation of the system, as well as a channel for feedback and non-urgent service requests.

The actions taken by a store manager using the control and monitoring station (on-site) 116 may result in communication with either a store administration server (Central) 112 or a store administration server (On-site) 120. The store administration server (Central) 112 communicates site administration input to the distribution server 106 where that input may affect presentation distribution or presentation configuration prior to distribution. When the administration input only affects post-distribution presentation configuration, it can be handled by the store administration server (On-site) 120 which can communicate directly with the On-site Players 118 to respond to the input.

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The control and monitoring station 116 can be implemented by a workstation which supports a typical world-wide web browser application, and is preferably a computer which is already in place in the store environment for administration use. Hosting the administration software using standard Internet protocols and tools such as HTTP, FTP, and HTML allows flexibility not only in the selection of the control and monitoring station 116 but also in the location of the administration functions. The store manager need not be aware of whether a particular function is implemented by a store administration server (central) 112 or a store administration server (on-site) 120. The distribution network can be used to update the content of the store administration server (on-site) 120 similar to presentation updates.

#### Fast-Food Restaurant Environment

Referring now to Figure 11, the use of the present invention in a fast-food restaurant will now be described. As shown in Figure 11, a fast-food restaurant includes a conventional fast-food restaurant counter 1100 including point-of-sale terminals and food and beverage dispensers. Above the counter 1100 is a menu board 1110. According to the present invention, the menu board comprises a digital multimedia menu board including a plurality of digital multimedia displays 1110a-1110d which are arranged in an array to form a virtual display. The digital multimedia menu board 1110 may include digital multimedia presentations of menu items and prices and advertisements for items which are presently being sold at the restaurant site.

Figure 11 illustrates one arrangement of a digital multimedia menu board 1110. However, it will be understood by those having skill in the art that many other arrangements may be provided. As shown in Figure 11, display 1110a illustrates a multimedia

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advertisement for a particular promotional meal. Displays 1110b and 1110c illustrate value meal promotions. Display 1110d illustrates individual menu items and their associated prices.

5 By providing animated movement, a consumer may be induced to try a featured special. The menu board 1110 may change constantly. For example, the menu board may also include advertisements relating to participation of the restaurant in a local charity  
10 event for the next week.

Digital multimedia menu boards of the present invention may attract people to purchase selected items at a restaurant. Moreover, the concept-to-delivery cycle may be dramatically shortened. An idea may be  
15 created, a prototype generated, revisions made, approval obtained and the message delivered to the environment in a short turnaround time and without costly and time-consuming printing and physical distribution of media. Moreover, the content can be  
20 changed constantly and the customer can see a different message with each visit. Messaging can be targeted and refreshed at will. Moreover, testing of new menu boards can be done quickly and results can be evaluated and changes made rapidly to develop highly effective  
25 messaging.

Well designed moving images can attract the consumer and deliver message effectively. The use of space can be optimized and multi-part messages can be shown over a short period of time on the same display.  
30 Environments can respond to market conditions quickly. A restaurant can rapidly react with its own competitive offerings. Moreover, if a promotion is not effective, the creative agency can rapidly refine the messaging to be more effective.

35 Messaging can be targeted by the time of day and promotional cycle. Customers can see only the breakfast menu in the morning and only the lunch menu

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at lunch time. Customer decision-making can therefore be faster and clutter may be reduced. Rush hour messaging can be quick and immediate, while off-peak messages can target a different customer.

5           Moreover, by delivering content digitally from a central location, with promotion parameters such as start and end dates automatically managed, execution can be nearly flawless and nearly effortless for the on-site staff. Resources can be managed more  
10           efficiently, because managers no longer need to depend on employees to install and maintain signage throughout the restaurant. Staff mistakes can be reduced or eliminated, and stores do not need to use spare storage space for bulky promotional display materials.

15           Figure 12 illustrates an interactive kiosk which may interface to the system of the present invention. The kiosk may be used to attract customers into the restaurant or to provide interactive game playing for a family as they enjoy a meal. Thus, the  
20           restaurant may become a center of family activities, rather than merely a location to eat.

          Accordingly, the present invention provides systems, methods and computer program products which distribute and manage digital multimedia presentations  
25           which typically function in a environment as promotional, operational or edutainment applications. The invention allows presentations to be delivered to all sites or to particular sites selected by region or specific address. Presentations are executed on-site  
30           using computer systems capable of driving multiple digital displays to create a single virtual display of various sizes. These computer systems are referred to as "players". Since presentations are stored on the player, the site may be disconnected from the network  
35           without impacting operations other than presentation distribution. A particular presentation may be static, or may be modified by integration of site-specific



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data. Data integration may occur dynamically or one time only, and may be performed by an in-store computer system or by a central computer system. Presentations may be interactive, as in a touchscreen order-entry, wayfinding, or game program, or passive, as in a simple promotional display which the end-user just reads. Presentations typically run without requiring any in-store personnel action, but may include selection, scheduling, or configuration options which allow on-site personnel to customize the presentations.

In the drawings and specification, there have been disclosed typical preferred embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

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## THAT WHICH IS CLAIMED:

1. A method for generating store displays for a plurality of stores, comprising the steps of:  
assembling at a central location, digital multimedia presentations for the plurality of stores;  
5 assigning start and end times to the digital multimedia presentations for the stores;  
transmitting the digital multimedia presentations and the assigned start and end times to the plurality of stores;  
10 receiving the digital multimedia presentations and the assigned start and end times at the stores;  
storing the received digital multimedia presentations in a digital multimedia player at the store; and  
15 upon occurrence of an assigned start time, automatically playing the associated stored received digital multimedia presentation on a digital multimedia display in the store, until occurrence of the assigned  
20 end time for the associated digital multimedia presentation.

2. A method according to Claim 1 further comprising the steps of:  
generating at the central location, a digital multimedia default presentation for the plurality of  
5 stores, the digital multimedia default presentation being free of a start time and an end time;  
transmitting the digital multimedia default presentation to the plurality of stores;  
receiving the digital multimedia default  
10 presentation at the stores;  
storing the received digital multimedia default presentation in the digital multimedia player at the store;

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15 detecting at the store, that an assigned end  
time for an associated digital multimedia presentation  
has occurred, and that a start time for a second  
digital multimedia presentation does not correspond to  
the assigned end time; and

20 automatically playing the stored received  
digital multimedia default presentation on the digital  
multimedia display in the store, upon detecting that an  
assigned end time for an associated digital multimedia  
presentation has occurred and that a start time for a  
second digital multimedia presentation does not  
25 correspond to the assigned end time.

3. A method according to Claim 1 further  
comprising the steps of:

generating at the central location, a digital  
multimedia default presentation for the plurality of  
5 stores, the digital multimedia default presentation  
being free of a start time and an end time;

transmitting the digital multimedia default  
presentation to the plurality of stores;

10 receiving the digital multimedia default  
presentation at the stores;

storing the received digital multimedia  
default presentation in the digital multimedia player  
at the store;

15 detecting at the store, that termination of a  
digital multimedia presentation has occurred prior to  
the assigned end time; and

20 automatically playing the stored received  
digital multimedia default presentation on the digital  
multimedia display in the store, upon detecting that  
termination of a digital multimedia presentation has  
occurred prior to the assigned end time.

4. A method according to Claim 1:

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wherein the assigning step further comprises the step of assigning a start and end date to the digital multimedia presentations for the stores;

5 wherein the transmitting step further comprises the step of transmitting the digital multimedia presentations and the assigned start and end times and start and end dates to the plurality of stores;

10 wherein the receiving step comprises the step of receiving the digital multimedia presentations and the assigned start and end times and start and end dates at the stores;

15 wherein the automatically playing step comprises the step of, upon occurrence of an assigned start time between the assigned start date and the assigned end date, automatically playing the associated stored received digital multimedia presentation on a digital multimedia display in the store, until  
20 occurrence of the assigned end time for the associated digital multimedia presentation; and

25 wherein the method further comprises the step of deleting the stored received digital multimedia presentation from the digital multimedia player at the store, after expiration of the assigned end date.

5. A method according to Claim 1 wherein the assembling step comprises the steps of:

generating at the central location, a generalized digital multimedia presentation for the  
5 plurality of stores; and

customizing the generalized digital multimedia presentation for selected ones of the plurality of stores, to create a plurality of customized digital multimedia presentations for  
10 selected ones of the stores.

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6. A method according to Claim 5 wherein the assigning step comprises the step of:

assigning start and end times and a store identification to the customized digital multimedia presentations for the stores; and

wherein the transmitting step comprises the step of:

transmitting the customized digital multimedia presentations and the assigned start and end times to the identified stores.

7. A method according to Claim 1 further comprising the steps of:

assembling at a central location, a default digital multimedia presentation for the plurality of stores;

transmitting the default digital multimedia presentation to the plurality of stores;

receiving the default digital multimedia presentation at the stores;

storing the received default digital multimedia presentation in a digital multimedia player at the store; and

wherein the step of automatically playing is followed by the step of:

automatically playing the stored received default digital multimedia presentation on the digital multimedia display in the store, upon occurrence of the assigned end time.

8. A method according to Claim 1 wherein the steps of transmitting and receiving are performed using at least one of a wired wide area network, a wireless wide area network and the internet.

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9. A method according to Claim 1 wherein the digital multimedia display is a virtual display comprising a plurality of display devices.

10. A method according to Claim 5 wherein the step of customizing is preceded by the step of:

accepting from the selected ones of the stores, customization data related to the selected ones of the stores; and

wherein the customizing step comprises the step of:

customizing the generalized digital multimedia presentation for selected ones of the plurality of stores using the customization data, to create a plurality of customized digital multimedia presentations for selected ones of the stores.

11. A method according to Claim 1 wherein the step of automatically playing is followed by the steps of:

measuring effectiveness of the digital multimedia presentation in the store; and

repeating the steps of assembling, assigning, transmitting receiving storing and automatically playing for second multimedia presentations, upon receipt of an indication that the digital multimedia presentation is not effective.

12. A method according to Claim 1 wherein the step of automatically playing comprises the step of automatically playing the stored received digital multimedia presentations on a digital multimedia display in the store in response to customer inputs, to provide interactive multimedia presentations.

13. A method according to Claim 1 wherein the step of storing is followed by the step of:

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customizing the stored received digital  
multimedia presentations with customization data for  
5 the store; and

wherein the step of automatically playing  
comprises the step of:

upon occurrence of the assigned start time,  
automatically playing the customized stored received  
10 digital multimedia presentations on the digital  
multimedia display in the store, until occurrence of  
the assigned end time.

14. A method for generating menu boards for  
an enterprise, including a plurality of sites,  
comprising the steps of:

assembling at a central location, digital  
5 multimedia menu presentations including a menu of items  
which are sold at the enterprise, and digital  
multimedia presentations for selected ones of the menu  
items;

generating, for the sites, a site-specific  
10 menu comprising selected ones of the items from the  
menu of items which are sold at the enterprise, the  
associated prices for the site, and specific multimedia  
advertisements, to form a customized digital multimedia  
menu board for the site including menu items offered at  
15 the site, the associated prices, and multimedia  
advertisements concerning the menu items;

transmitting the customized digital  
multimedia presentations from the central location to  
the associated sites;

20 receiving the customized digital multimedia  
presentation at the associated site;

storing the received customized digital  
multimedia presentation in a digital multimedia player  
at the site; and

25 automatically playing the customized digital  
multimedia presentation on a digital multimedia menu

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board at the associated site, so that the digital multimedia menu board indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

30

15. A method according to Claim 14:

wherein the generating step further comprises the step of assigning start and end times for the digital multimedia presentations for the sites;

5

wherein the transmitting step comprises the step of transmitting the customized digital multimedia presentations and the assigned start and end times to the associated sites;

wherein the receiving step comprises the step of receiving the customized digital multimedia presentation and the assigned start and end times at the associated site; and

10

wherein the automatically playing step comprises the step of, upon occurrence of an assigned start time, automatically playing the customized digital multimedia presentation on a digital multimedia menu board in the site, until occurrence of the assigned end time for the customized digital multimedia presentation so that the digital multimedia menu board indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

15

20

16. A method according to Claim 15 further comprising the steps of:

generating at the central location, a digital multimedia default menu presentation for the enterprise, the digital multimedia default menu presentation being free of a start time and an end time;

5

transmitting the digital multimedia default menu presentation to the plurality of sites;



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- 10           receiving the digital multimedia default menu presentation at the sites;
- storing the received digital multimedia default menu presentation in the digital multimedia player at the site;
- 15           detecting at the site, that an assigned end time for an associated digital multimedia menu presentation has occurred, and that a start time for a second digital multimedia menu presentation does not correspond to the assigned end time; and
- 20           automatically playing the stored received digital multimedia default menu presentation on the digital multimedia menu board in the store, upon detecting that an assigned end time for an associated digital multimedia menu presentation has occurred and
- 25           that a start time for a second digital multimedia menu presentation does not correspond to the assigned end time.

17. A method according to Claim 15 further comprising the steps of:

- generating at the central location, a digital multimedia default menu presentation for the
- 5           enterprise, the digital multimedia default menu presentation being free of a start time and an end time;
- transmitting the digital multimedia default menu presentation to the plurality of sites;
- 10           receiving the digital multimedia default menu presentation at the sites;
- storing the received digital multimedia default menu presentation in the digital multimedia player at the site;
- 15           detecting at the site, that termination of a digital multimedia menu presentation has occurred prior to the assigned end time; and

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20 automatically playing the stored received digital multimedia default menu presentation on the digital multimedia menu board in the store, upon detecting that termination of a digital multimedia menu presentation has occurred prior to the assigned end time.

18. A method according to Claim 15:  
wherein the assigning step further comprises the step of assigning a start and end date to the digital multimedia menu presentations for the sites;  
5 wherein the transmitting step further comprises the step of transmitting the digital multimedia menu presentations and the assigned start and end times and start and end dates to the plurality of sites;  
10 wherein the receiving step comprises the step of receiving the digital multimedia menu presentations and the assigned start and end times and start and end dates at the sites;  
wherein the automatically playing step  
15 comprises the step of, upon occurrence of an assigned start time between the assigned start date and the assigned end date, automatically playing the associated stored received digital multimedia menu presentation on a digital multimedia menu board in the store, until  
20 occurrence of the assigned end time for the associated digital multimedia menu presentation; and  
wherein the method further comprises the step of deleting the stored received digital multimedia menu presentation from the digital multimedia player at the  
25 site, after expiration of the assigned end date.

19. A method according to Claim 15 further comprising the steps of:

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- assembling at a central location, a default digital multimedia menu presentation for the enterprise;
- transmitting the default digital multimedia menu presentation to the plurality of sites;
- receiving the default digital multimedia menu presentation at the sites;
- storing the received default digital multimedia menu presentation in a digital multimedia player at the site; and
- wherein the step of automatically playing is followed by the step of:
- automatically playing the stored received default digital multimedia menu presentation on the digital multimedia menu board in the site, upon occurrence of the assigned end time.

20. A method according to Claim 14 wherein the steps of transmitting and receiving are performed using at least one of a wired wide area network, a wireless wide area network and the internet.

21. A method according to Claim 14 wherein the digital multimedia menu board is a virtual display comprising a plurality of display devices.

22. A method according to Claim 14 wherein the step of generating is preceded by the step of:
- accepting from the selected ones of the sites, customization data related to the items and prices of items which are sold at the selected site.

23. A method according to Claim 14 wherein the step of automatically playing is followed by the steps of:
- measuring effectiveness of the digital multimedia menu presentation in the store; and

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repeating the steps of assembling,  
generating, transmitting, receiving, storing and  
automatically playing for second multimedia menu  
presentations, upon receipt of an indication that the  
10 digital multimedia menu presentation is not effective.

24. A method according to Claim 14 wherein  
the step of automatically playing comprises the step of  
automatically playing the stored received digital  
multimedia menu presentations on a digital multimedia  
5 menu board in the store in response to customer inputs,  
to provide interactive menu board presentations.

25. A method according to Claim 14 wherein  
the step of storing is followed by the step of:  
further customizing the stored received  
digital multimedia menu presentations with  
5 customization data for the store; and  
wherein the step of automatically playing  
comprises the step of:  
automatically playing the further customized  
digital multimedia presentation on a digital multimedia  
10 menu board at the associated site, so that the digital  
multimedia menu board indicates the menu items and  
prices, and advertisements for items which are  
presently being sold at the site.

26. A system for generating store displays  
for a plurality of stores, comprising:  
a central system including means for  
assembling digital multimedia presentations for the  
5 plurality of stores and for assigning start and end  
times to the digital multimedia presentations for the  
stores;  
a network which transmits the digital  
multimedia presentations and the assigned start and end  
10 times to the plurality of stores; and

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a digital multimedia system at each of the stores, the digital multimedia system comprising:

means for storing the received digital multimedia presentations; and

15 digital multimedia displaying means, responsive to occurrence of an assigned start time, for automatically playing the associated stored received digital multimedia presentation, until occurrence of the assigned end time for the associated digital  
20 multimedia presentation.

27. A system according to Claim 26 wherein the central system further comprises:

means for generating a digital multimedia default presentation for the plurality of stores, the  
5 digital multimedia default presentation being free of a start time and an end time; and

wherein the digital multimedia system further comprises:

10 means for storing the received digital multimedia default presentation;

means for detecting that an assigned end time for an associated digital multimedia presentation has occurred, and that a start time for a second digital multimedia presentation does not correspond to the  
15 assigned end time; and

wherein the digital multimedia displaying means further comprises means for automatically playing the stored received digital multimedia default presentation on the digital multimedia displaying  
20 means, upon detecting that an assigned end time for an associated digital multimedia presentation has occurred and that a start time for a second digital multimedia presentation does not correspond to the assigned end time.

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28. A system according to Claim 26 wherein the central system further comprises:

means for generating a digital multimedia default presentation for the plurality of stores, the digital multimedia default presentation being free of a start time and an end time; and

wherein the digital multimedia system further comprises:

means for storing the received digital multimedia default presentation;

means for detecting that termination of a digital multimedia presentation has occurred prior to the assigned end time; and

wherein the digital multimedia displaying means further comprises means for automatically playing the stored received digital multimedia default presentation on the digital multimedia displaying means, upon detecting that termination of a digital multimedia presentation has occurred prior to the assigned end time.

29. A system according to Claim 26 wherein the central system further comprises:

means for assigning a start and end date to the digital multimedia presentations for the stores; and

wherein the digital multimedia displaying means further comprises means, responsive to occurrence of an assigned start time between the assigned start date and the assigned end date, for automatically playing the associated stored received digital multimedia presentation on the digital multimedia displaying means, until occurrence of the assigned end time for the associated digital multimedia presentation; and

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wherein the digital multimedia system further comprises means for deleting the stored received digital multimedia presentation, after expiration of the assigned end date.

30. A system according to Claim 26 wherein the assembling means comprises:

means for generating a generalized digital multimedia presentation for the plurality of stores;  
5 and

means for customizing the generalized digital multimedia presentation for selected ones of the plurality of stores, to create a plurality of customized digital multimedia presentations for  
10 selected ones of the stores.

31. A system according to Claim 30 wherein the assigning means comprises:

means for assigning start and end times and a store identification to the customized digital  
5 multimedia presentations for the stores.

32. A system according to Claim 26 wherein the central system further comprises:

means for assembling a default digital multimedia presentation for the plurality of stores;  
5 wherein the digital multimedia system comprises:

means for storing the received default digital multimedia presentation; and  
10 wherein the digital multimedia displaying means further comprises:

means for automatically playing the stored received default digital multimedia presentation on the digital multimedia displaying means, upon occurrence of the assigned end time.

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33. A system according to Claim 26 wherein the network comprises at least one of a wired wide area network, a wireless wide area network and the internet.

34. A system according to Claim 26 wherein the digital multimedia displaying means comprises a virtual display including a plurality of display devices.

35. A system according to Claim 30 wherein the central system further comprises:

means for accepting from the selected ones of the stores, customization data related to the selected ones of the stores; and

wherein the customizing means comprises:

means for customizing the generalized digital multimedia presentation for selected ones of the plurality of stores using the customization data, to create a plurality of customized digital multimedia presentations for selected ones of the stores.

36. A system according to Claim 26 wherein the central system further comprises:

means for measuring effectiveness of the digital multimedia presentation in the store; and

means for assembling second multimedia presentations, upon receipt of an indication that the digital multimedia presentation is not effective.

37. A system according to Claim 26 wherein the digital multimedia displaying means is further responsive to customer inputs, to provide interactive multimedia presentations.

38. A system according to Claim 26 wherein the digital multimedia system further comprises:



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means for customizing the stored received digital multimedia presentations with customization data for the store.

39. A system for generating menu boards for an enterprise including a plurality of sites, comprising:

a central system including means for assembling digital multimedia menu presentations including a menu of items which are sold at the enterprise, and digital multimedia presentations for selected ones of the menu items, and for generating, for the sites, a site-specific menu comprising selected ones of the items from the menu of items which are sold at the enterprise, the associated prices for the site, and specific multimedia advertisements, to form a customized digital multimedia menu board for the site including menu items offered at the site, the associated prices, and multimedia advertisements concerning the menu items;

a network which transmits the customized digital multimedia presentations from the central location to the associated sites; and

a digital multimedia system at each of the sites, the digital multimedia system comprising:

means for storing the received customized digital multimedia presentation; and

digital multimedia menu board displaying means, for automatically playing the customized digital multimedia presentation, so that the digital multimedia menu board displaying means indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

40. A system according to Claim 39:

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wherein the central system further comprises means for assigning start and end times for the digital multimedia presentations for the sites; and

5 wherein the digital multimedia menu board displaying means comprises means, responsive to an assigned start time, for automatically playing the customized digital multimedia presentation on the digital multimedia menu board displaying means, until  
10 occurrence of the assigned end time for the customized digital multimedia presentation so that the digital multimedia menu board displaying means indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

41. A system according to Claim 40 wherein the central site further comprises:

means for generating a digital multimedia default menu presentation for the enterprise, the  
5 digital multimedia default menu presentation being free of a start time and an end time; and

wherein the digital multimedia system further comprises:

10 means for storing the received digital multimedia default menu presentation;

means for detecting that an assigned end time for an associated digital multimedia menu presentation has occurred, and that a start time for a second digital multimedia menu presentation does not  
15 correspond to the assigned end time; and

wherein the digital multimedia menu board displaying means further comprises means for automatically playing the stored received digital multimedia default menu presentation, upon detecting  
20 that an assigned end time for an associated digital multimedia menu presentation has occurred and that a start time for a second digital multimedia menu

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presentation does not correspond to the assigned end time.

42. A system according to Claim 40 wherein the central system further comprises:

means for generating a digital multimedia default menu presentation for the enterprise, the digital multimedia default menu presentation being free of a start time and an end time; and

wherein the digital multimedia system further comprises:

means for storing the received digital multimedia default menu presentation;

means for detecting that termination of a digital multimedia menu presentation has occurred prior to the assigned end time; and

wherein the digital multimedia menu board displaying means comprises means for automatically playing the stored received digital multimedia default menu presentation, upon detecting that termination of a digital multimedia menu presentation has occurred prior to the assigned end time.

43. A system according to Claim 40 wherein the central system further comprises:

means for assigning a start and end date to the digital multimedia menu presentations for the sites; and

wherein the digital multimedia displaying means further comprises means, responsive to occurrence of an assigned start time between the assigned start date and the assigned end date, for automatically playing the associated stored received digital multimedia menu presentation, until occurrence of the assigned end time for the associated digital multimedia menu presentation; and

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15 means for deleting the stored received  
digital multimedia menu presentation from the digital  
multimedia system, after expiration of the assigned end  
date.

44. A system according to Claim 40 wherein  
the central system further comprises:

means for assembling a default digital  
multimedia menu presentation for the enterprise;  
5 wherein the digital multimedia system  
comprises:

means for storing the received default  
digital multimedia menu presentation; and

10 wherein the digital multimedia menu board  
displaying means further comprises:

means for automatically playing the stored  
received default digital multimedia menu presentation  
on the digital multimedia menu board displaying means  
upon occurrence of the assigned end time.

45. A system according to Claim 39 wherein  
the network comprises at least one of a wired wide area  
network, a wireless wide area network and the internet.

46. A system according to Claim 39 wherein  
the digital multimedia menu board displaying means  
comprises a virtual display including a plurality of  
display devices.

47. A system according to Claim 39 wherein  
the central system further comprises:

means for accepting from the selected ones of  
the sites, customization data related to the items and  
5 prices of items which are sold at the selected site.

48. A system according to Claim 39 wherein  
the central system further comprises:

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means for measuring effectiveness of the digital multimedia menu presentation in the store; and  
5 means for assembling second multimedia menu presentations, upon receipt of an indication that the digital multimedia menu presentation is not effective.

49. A system according to Claim 39 wherein the digital multimedia menu board displaying means is responsive to customer inputs, to provide interactive menu board presentations.

50. A system according to Claim 39 wherein the digital multimedia system further comprises:

means for further customizing the stored received digital multimedia menu presentations with  
5 customization data for the store.

51. A computer program product for generating store displays for a plurality of stores, the computer program product including a computer-readable storage medium having computer-readable  
5 program code means embodied in the medium, the computer-readable program code means comprising:

computer-readable program code means for assembling digital multimedia presentations for the plurality of stores and for assigning start and end  
10 times to the digital multimedia presentations for the stores; and

computer-readable program code means for automatically playing the associated stored received digital multimedia presentation on a digital multimedia  
15 display in the store upon occurrence of an assigned start time, until occurrence of the assigned end time for the associated digital multimedia presentation.

52. A computer program product according to Claim 51 further comprising:

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computer-readable program code means for generating a digital multimedia default presentation for the plurality of stores, the digital multimedia default presentation being free of a start time and an end time;

computer-readable program code means for detecting that an assigned end time for an associated digital multimedia presentation has occurred, and that a start time for a second digital multimedia presentation does not correspond to the assigned end time; and

computer-readable program code means for automatically playing the stored received digital multimedia default presentation on the digital multimedia display, upon detecting that an assigned end time for an associated digital multimedia presentation has occurred and that a start time for a second digital multimedia presentation does not correspond to the assigned end time.

53. A computer program product according to Claim 51 further comprising:

computer-readable program code means for generating a digital multimedia default presentation for the plurality of stores, the digital multimedia default presentation being free of a start time and an end time;

computer-readable program code means for detecting that termination of a digital multimedia presentation has occurred prior to the assigned end time; and

computer-readable program code means for automatically playing the stored received digital multimedia default presentation on the digital multimedia display, upon detecting that termination of a digital multimedia presentation has occurred prior to the assigned end time.

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54. A computer program product according to Claim 51 further comprising:

5 computer-readable program code means for assigning a start and end date to the digital multimedia presentations for the stores;

10 computer-readable program code means, responsive to occurrence of an assigned start time between the assigned start date and the assigned end date, for automatically playing the associated stored received digital multimedia presentation on the digital multimedia displaying means, until occurrence of the assigned end time for the associated digital multimedia presentation; and

15 computer-readable program code means for deleting the stored received digital multimedia presentation, after expiration of the assigned end date.

55. A computer program product according to Claim 51 wherein the computer-readable program code assembling means comprises:

5 computer-readable program code means for generating a generalized digital multimedia presentation for the plurality of stores; and

10 computer-readable program code means for customizing the generalized digital multimedia presentation for selected ones of the plurality of stores, to create a plurality of customized digital multimedia presentations for selected ones of the stores.

56. A computer program product according to Claim 55 wherein the computer-readable program code assigning means comprises:

5 computer-readable program code means for assigning start and end times and a store

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identification to the customized digital multimedia presentations for the stores.

57. A computer program product according to Claim 51 further comprising:

5 computer-readable program code means for assembling a default digital multimedia presentation for the plurality of stores; and

10 computer-readable program code means for automatically playing the stored received default digital multimedia presentation on the digital multimedia display, upon occurrence of the assigned end time.

58. A computer program product according to Claim 55 further comprising:

5 computer-readable program code means for accepting from the selected ones of the stores, customization data related to the selected ones of the stores; and

wherein the computer-readable program code customizing means comprises:

10 computer-readable program code means for customizing the generalized digital multimedia presentation for selected ones of the plurality of stores using the customization data, to create a plurality of customized digital multimedia presentations for selected ones of the stores.

59. A computer program product according to Claim 51 further comprising:

5 computer-readable program code means for measuring effectiveness of the digital multimedia presentation in the store; and

computer-readable program code means for assembling second multimedia presentations, upon



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receipt of an indication that the digital multimedia presentation is not effective.

60. A computer program product for generating menu boards for an enterprise including a plurality of sites, the computer program product including a computer-readable storage medium having  
5 computer-readable program code means embodied in the medium, the computer-readable program code means comprising:

computer-readable program code means for assembling digital multimedia menu presentations  
10 including a menu of items which are sold at the enterprise, and digital multimedia presentations for selected ones of the menu items, and for generating, for the sites, a site-specific menu comprising selected ones of the items from the menu of items which are sold  
15 at the enterprise, the associated prices for the site, and specific multimedia advertisements, to form a customized digital multimedia menu board for the site including menu items offered at the site, the associated prices, and multimedia advertisements  
20 concerning the menu items; and

computer-readable program code means for automatically playing the customized digital multimedia presentation on a digital multimedia menu board display at the associated site, so that the digital multimedia  
25 menu board display indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

61. A computer program product according to Claim 60 further comprising:

computer-readable program code means for assigning start and end times for the digital  
5 multimedia presentations for the sites; and

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wherein the computer-readable program code automatically playing means comprises computer-readable program code means, responsive to an assigned start time, for automatically playing the customized digital multimedia presentation on the digital multimedia menu board display, until occurrence of the assigned end time for the customized digital multimedia presentation so that the digital multimedia menu board display indicates the menu items and prices, and advertisements for items which are presently being sold at the site.

62. A computer program product according to Claim 61 further comprising:

computer-readable program code means for generating a digital multimedia default menu presentation for the enterprise, the digital multimedia default menu presentation being free of a start time and an end time;

computer-readable program code means for detecting that an assigned end time for an associated digital multimedia menu presentation has occurred, and that a start time for a second digital multimedia menu presentation does not correspond to the assigned end time; and

computer-readable program code means for automatically playing the stored received digital multimedia default menu presentation on the digital multimedia menu board display in the store, upon detecting that an assigned end time for an associated digital multimedia menu presentation has occurred and that a start time for a second digital multimedia menu presentation does not correspond to the assigned end time.

63. A computer program product according to Claim 61 further comprising:

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computer-readable program code means for  
generating a digital multimedia default menu  
5 presentation for the enterprise, the digital multimedia  
default menu presentation being free of a start time  
and an end time;

computer-readable program code means for  
detecting that termination of a digital multimedia menu  
10 presentation has occurred prior to the assigned end  
time; and

computer-readable program code means for  
automatically playing the stored received digital  
multimedia default menu presentation on the digital  
15 multimedia menu board in the store, upon detecting that  
termination of a digital multimedia menu presentation  
has occurred prior to the assigned end time.

64. A computer program product according to  
Claim 61 further comprising:

computer-readable program code means for  
assigning a start and end date to the digital  
5 multimedia menu presentations for the sites;

computer-readable program code means,  
responsive to occurrence of an assigned start time  
between the assigned start date and the assigned end  
date, for automatically playing the associated stored  
10 received digital multimedia menu presentation on the  
digital multimedia menu board display, until occurrence  
of the assigned end time for the associated digital  
multimedia menu presentation; and

computer-readable program code means for  
15 deleting the stored received digital multimedia menu  
presentation, after expiration of the assigned end  
date.

65. A computer program product according to  
Claim 61 further comprising:

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computer-readable program code means for assembling a default digital multimedia menu presentation for the enterprise; and

5 computer-readable program code means for automatically playing the stored received default digital multimedia menu presentation on the digital multimedia menu board display upon occurrence of the

10 assigned end time.

66. A computer program product according to Claim 60 further comprising:

computer-readable program code means for accepting from the selected ones of the sites,

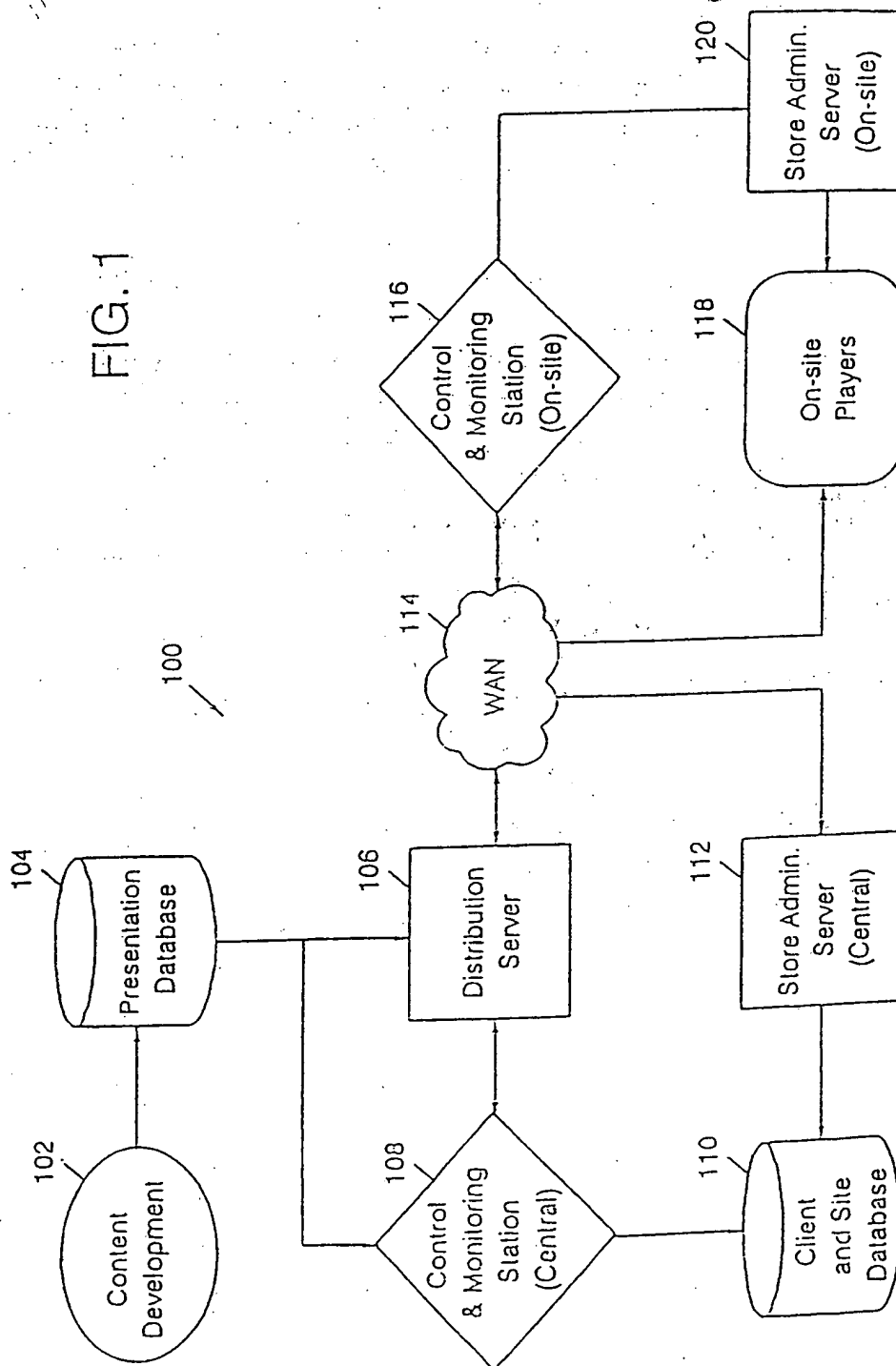
5 customization data related to the items and prices of items which are sold at the selected site.

67. A computer program product according to Claim 60 further comprising:

computer-readable program code means for measuring effectiveness of the digital multimedia menu presentation in the store; and

5 computer-readable program code means for assembling second multimedia menu presentations, upon receipt of an indication that the digital multimedia menu presentation is not effective.

FIG. 1



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FIG. 2A

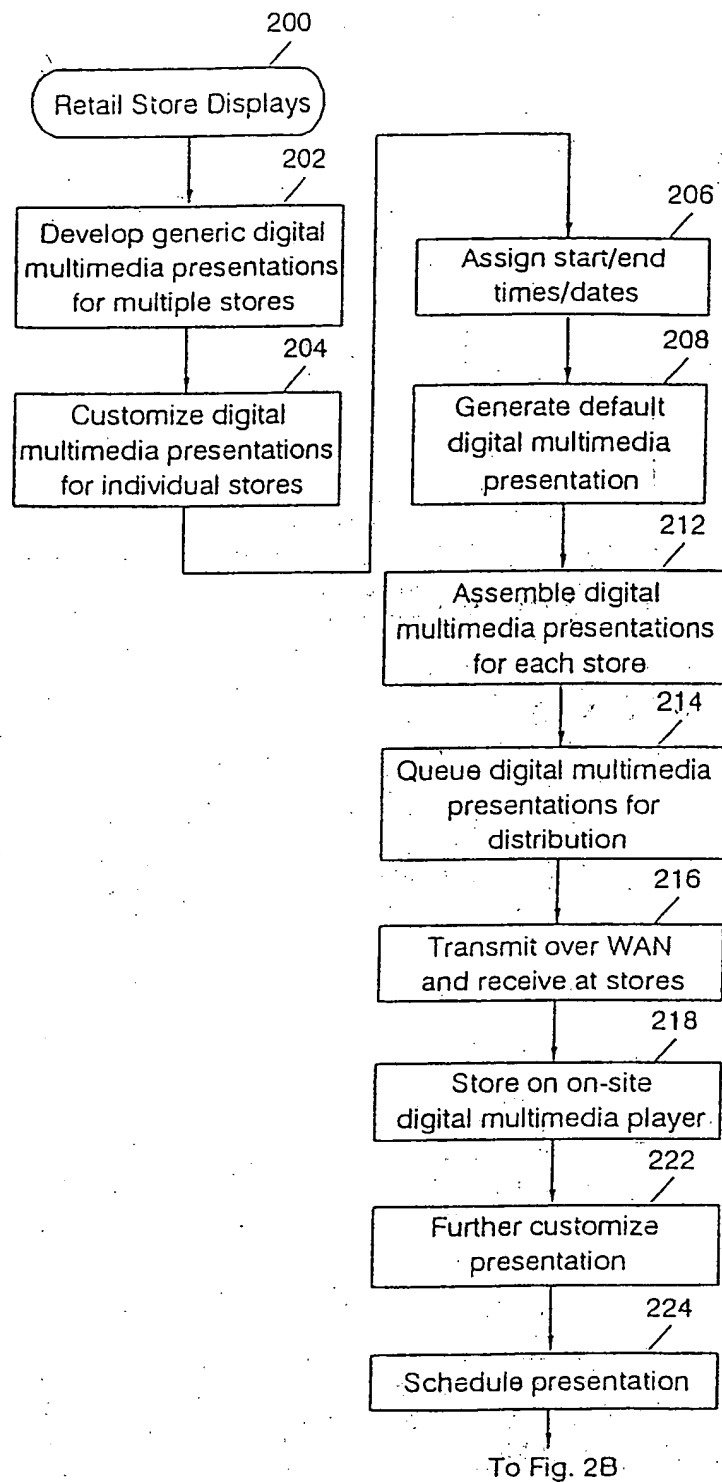
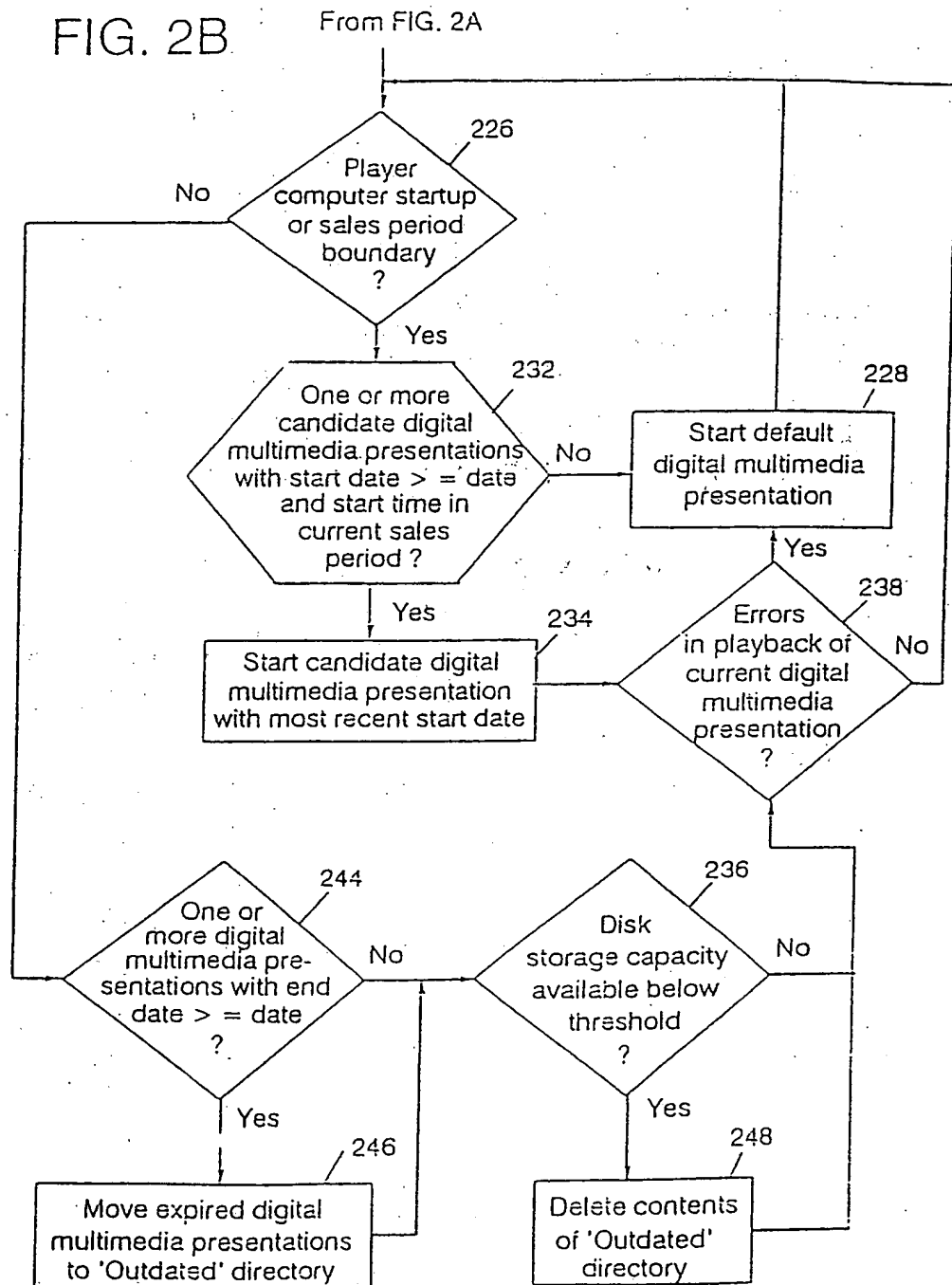


FIG. 2B



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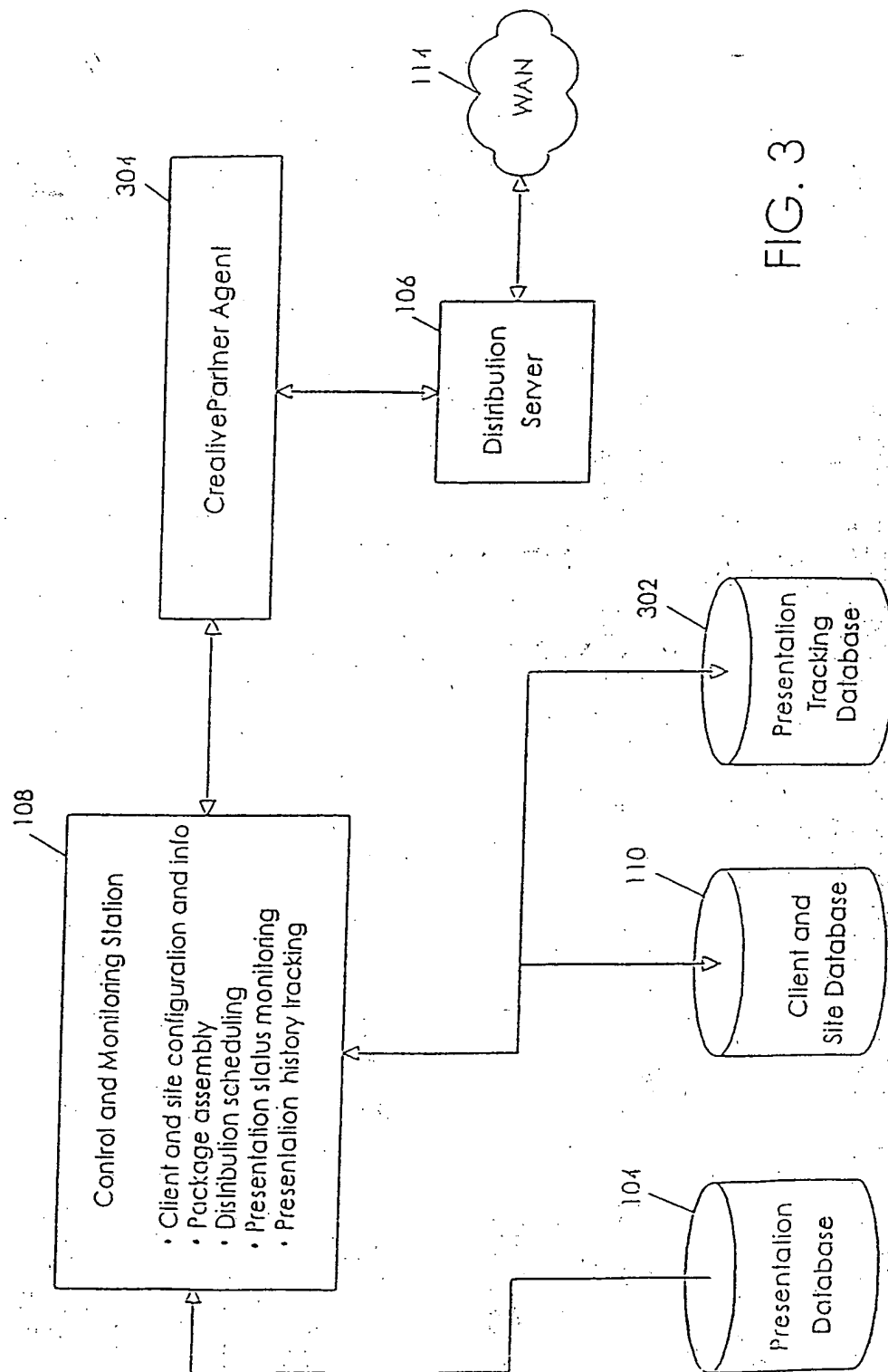
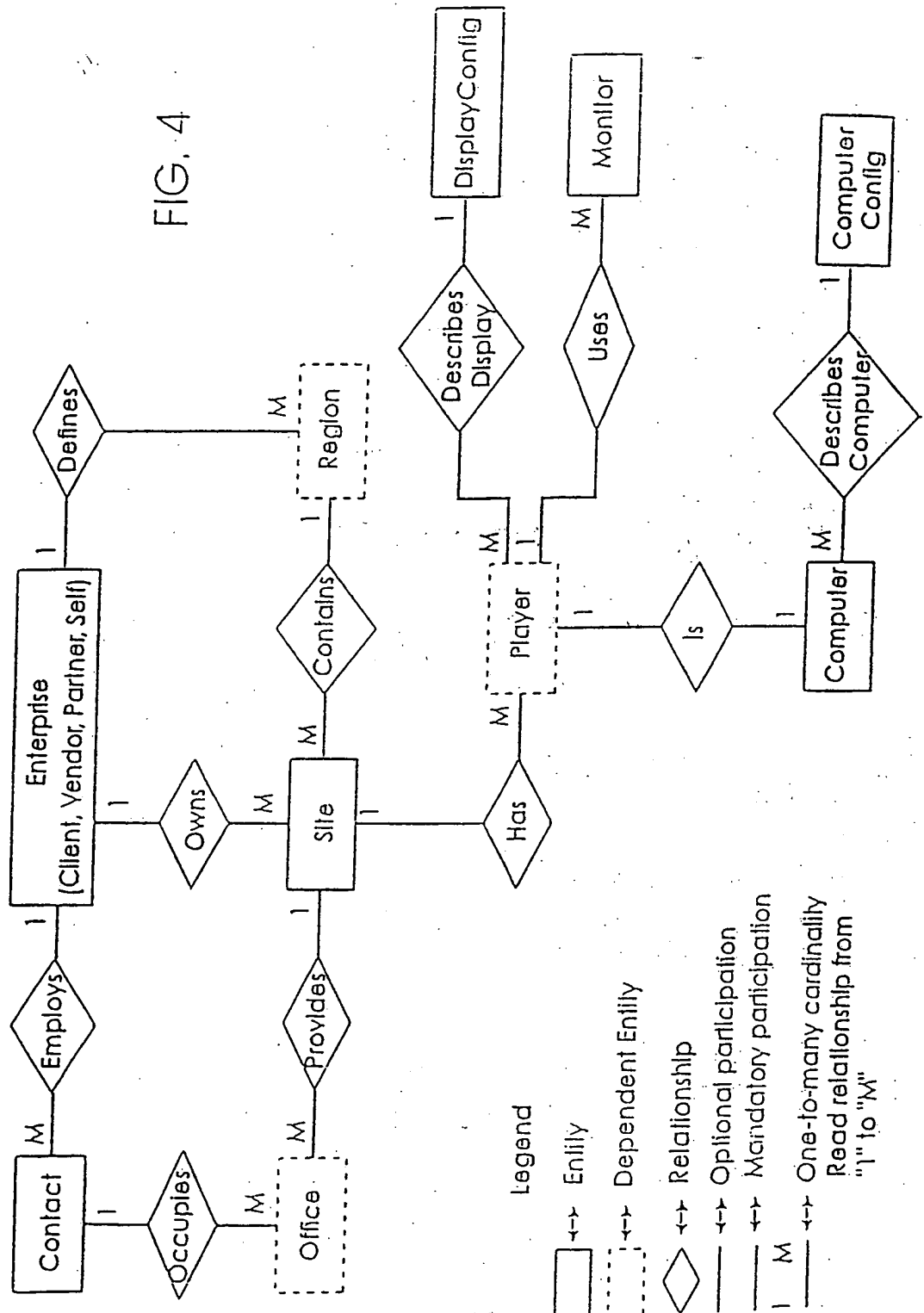


FIG. 3

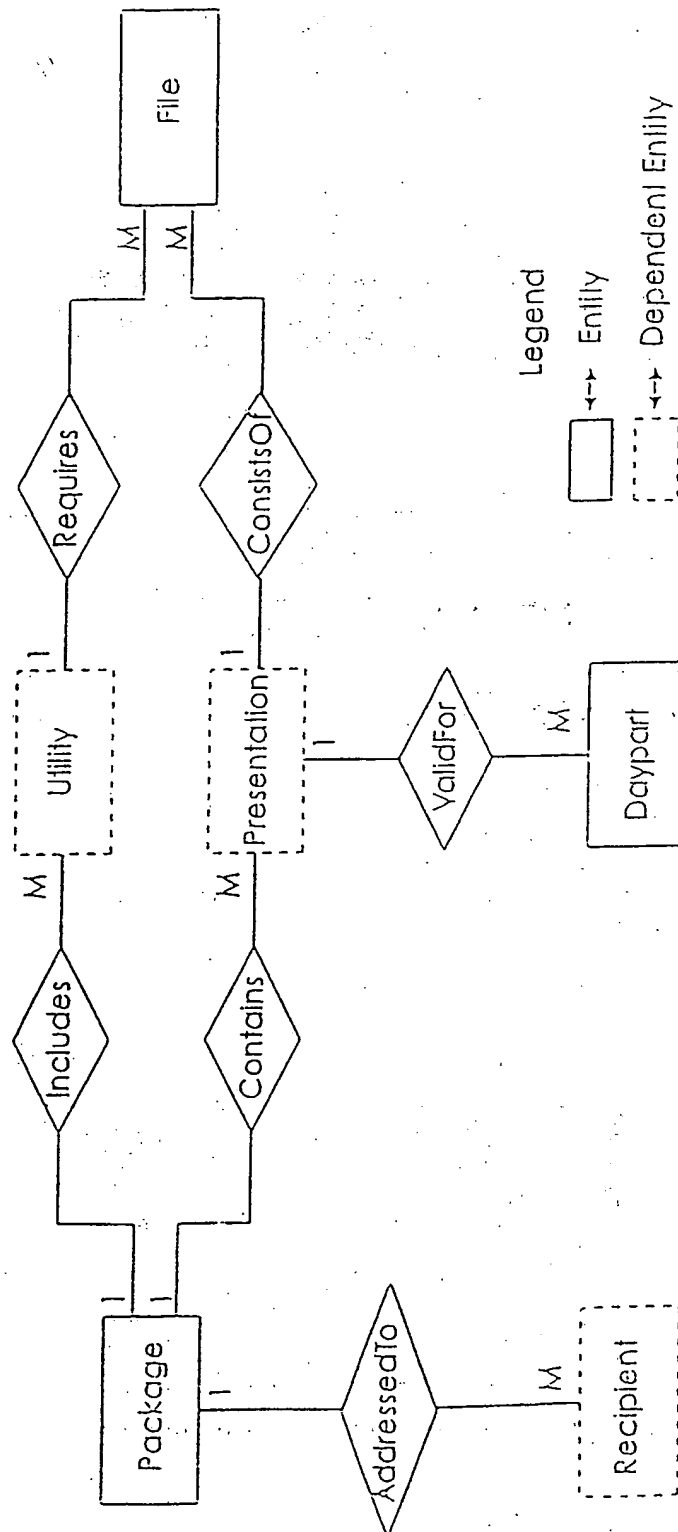


FIG. 4



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FIG. 5

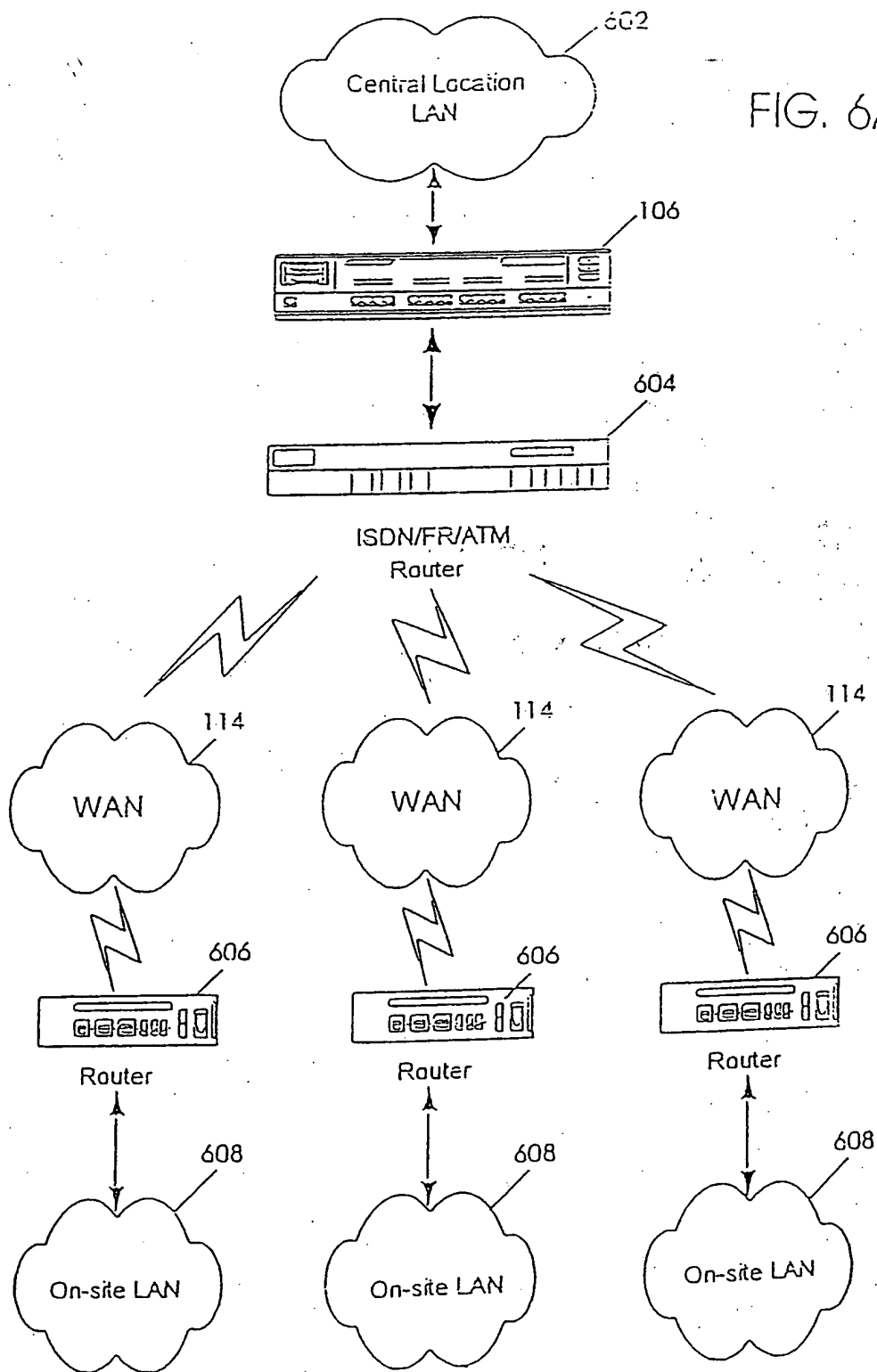


Legend

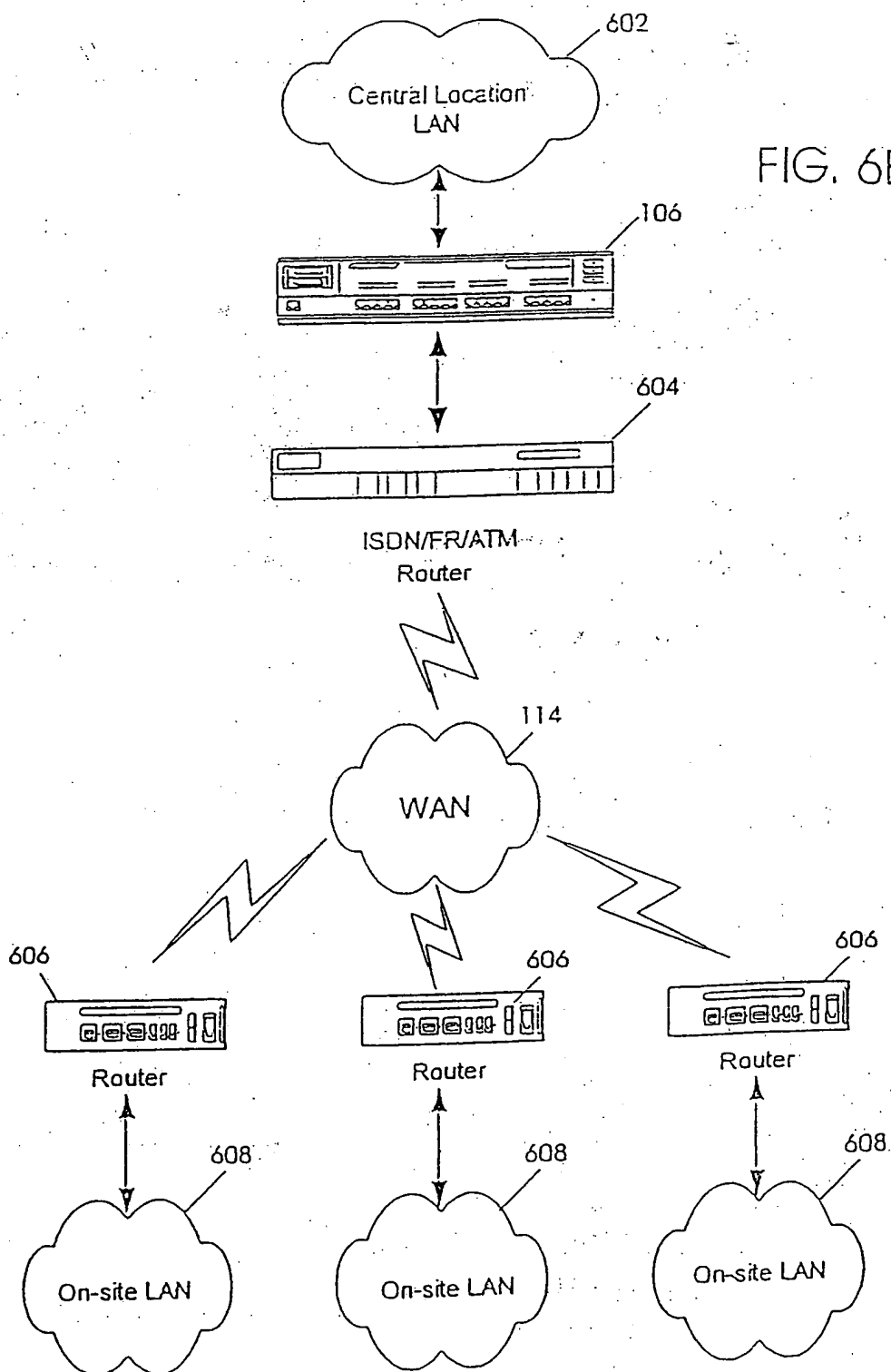
- Entity
- Dependent Entity
- Relationship
- Optional participation
- Mandatory participation
- One-to-many cardinality  
Read relationship from "1" to "M"

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FIG. 6A

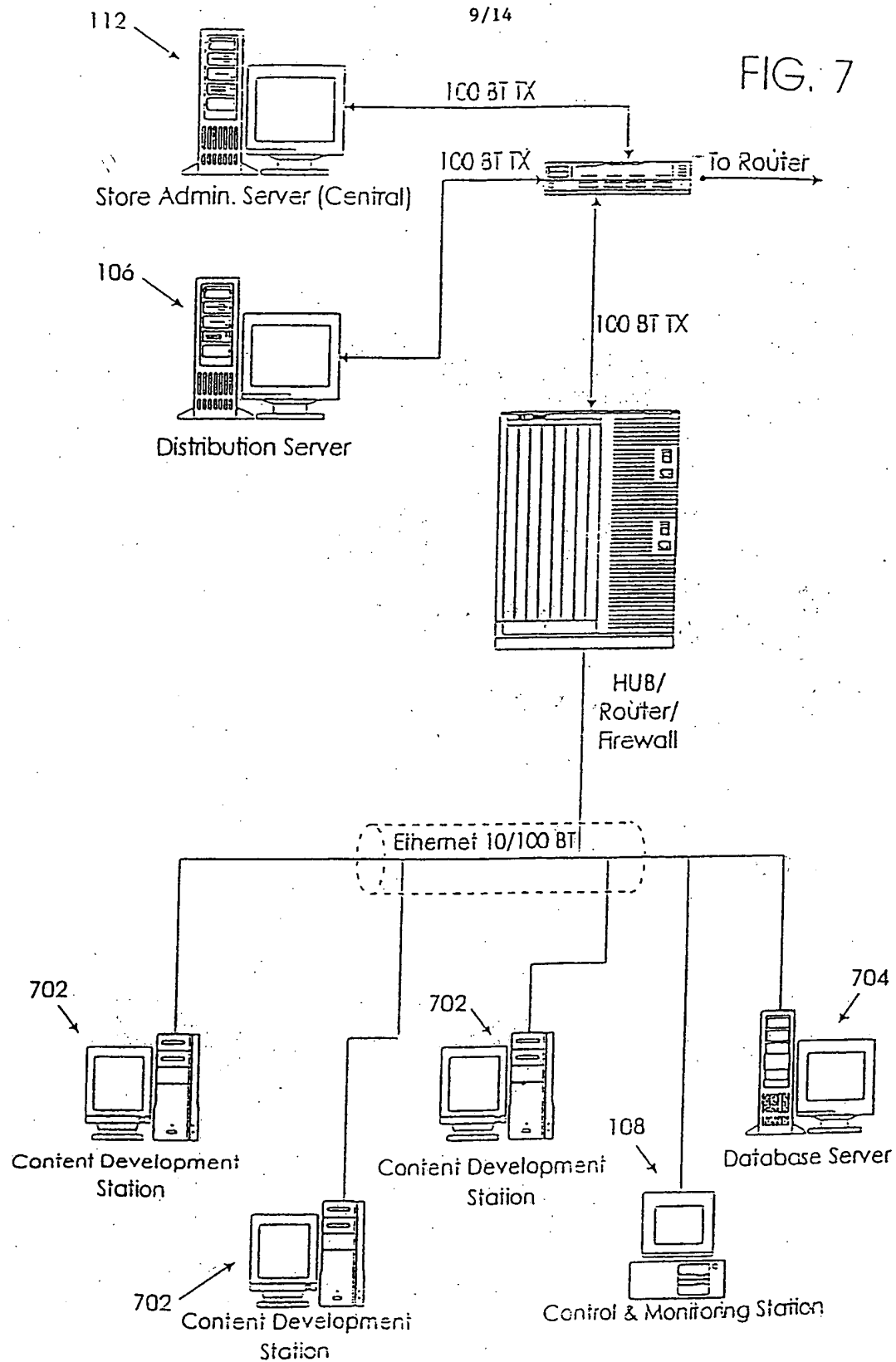


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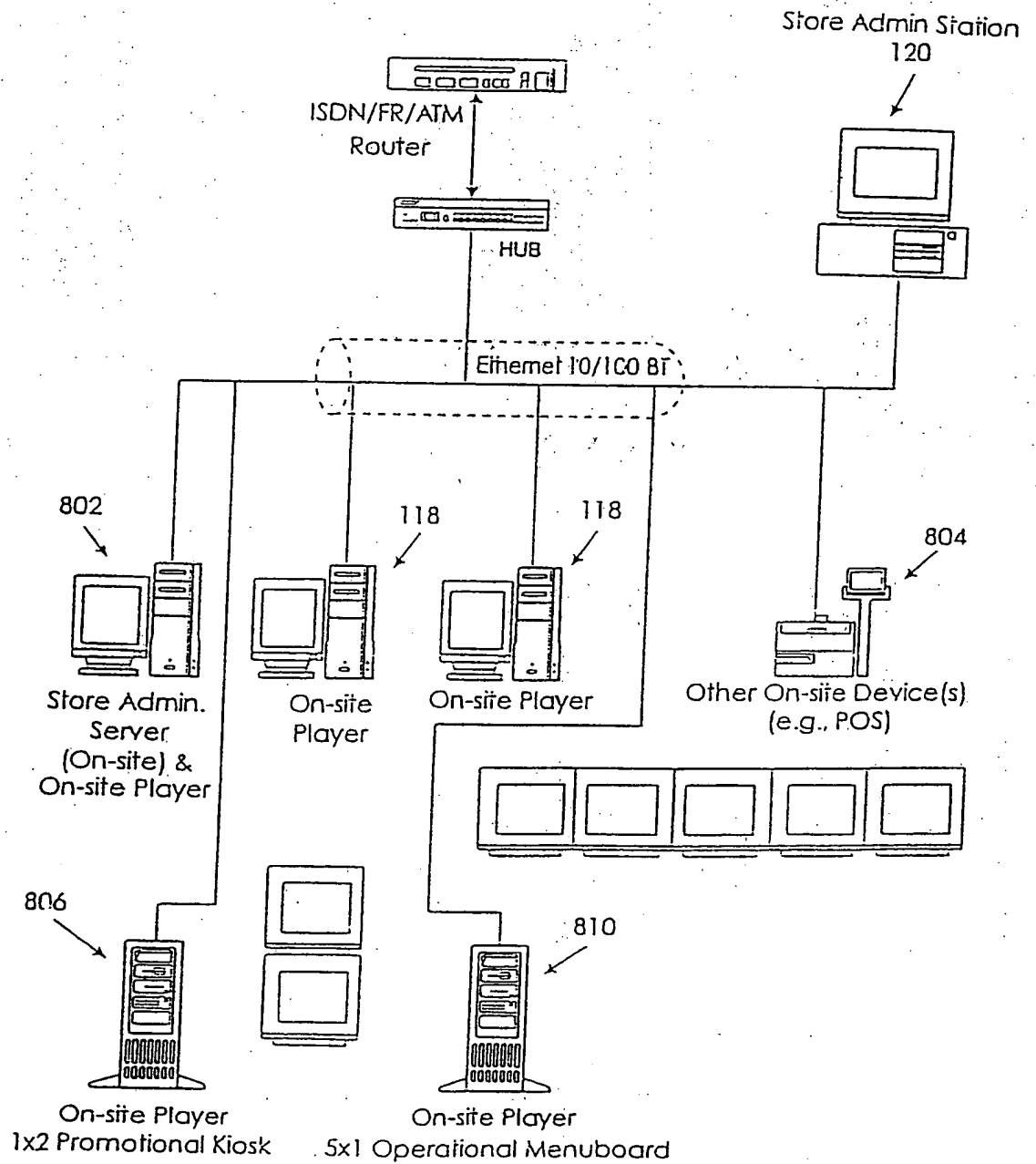
FIG. 7



SUBSTITUTE SHEET (RULE 26)

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FIG. 8



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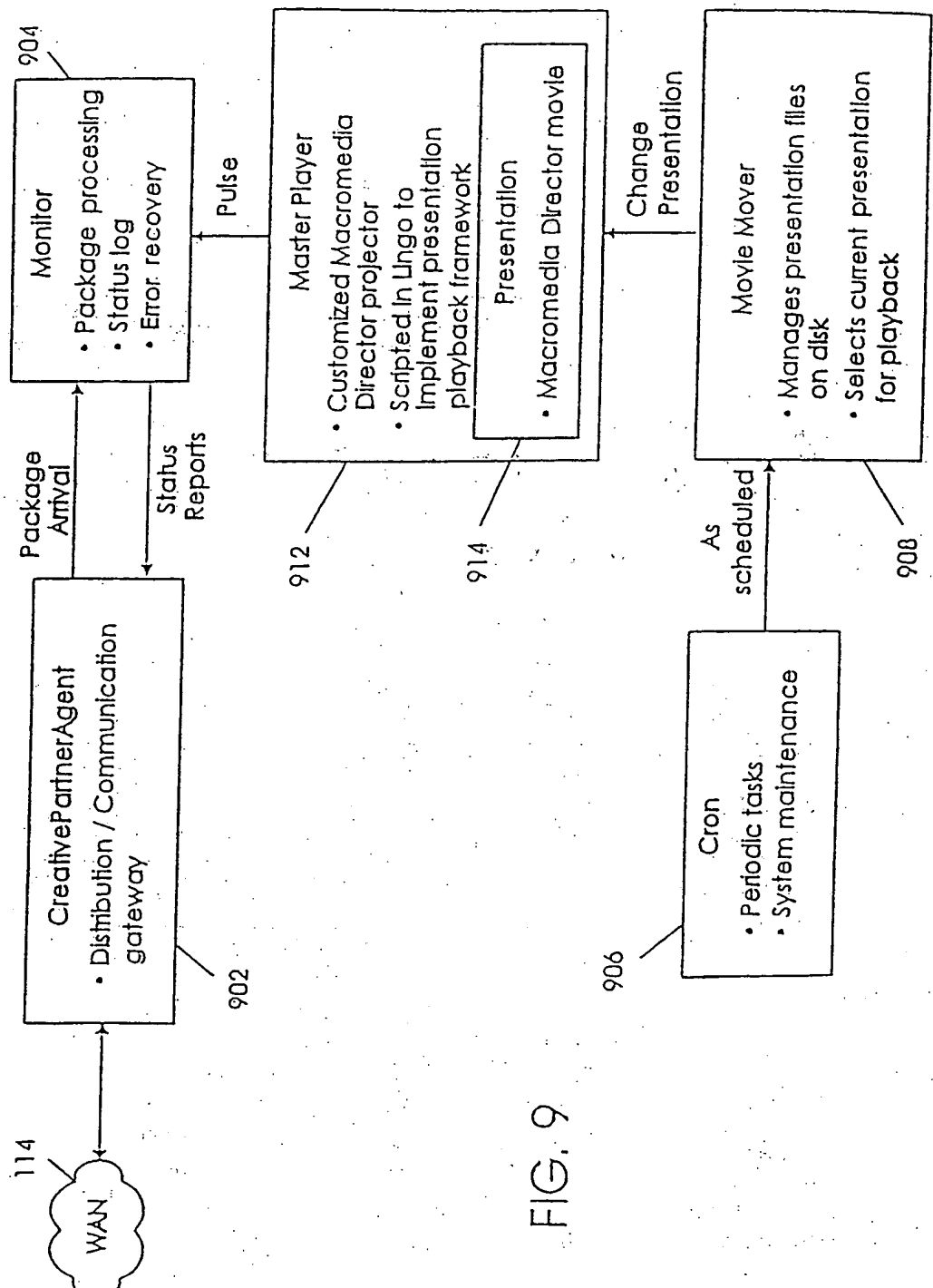
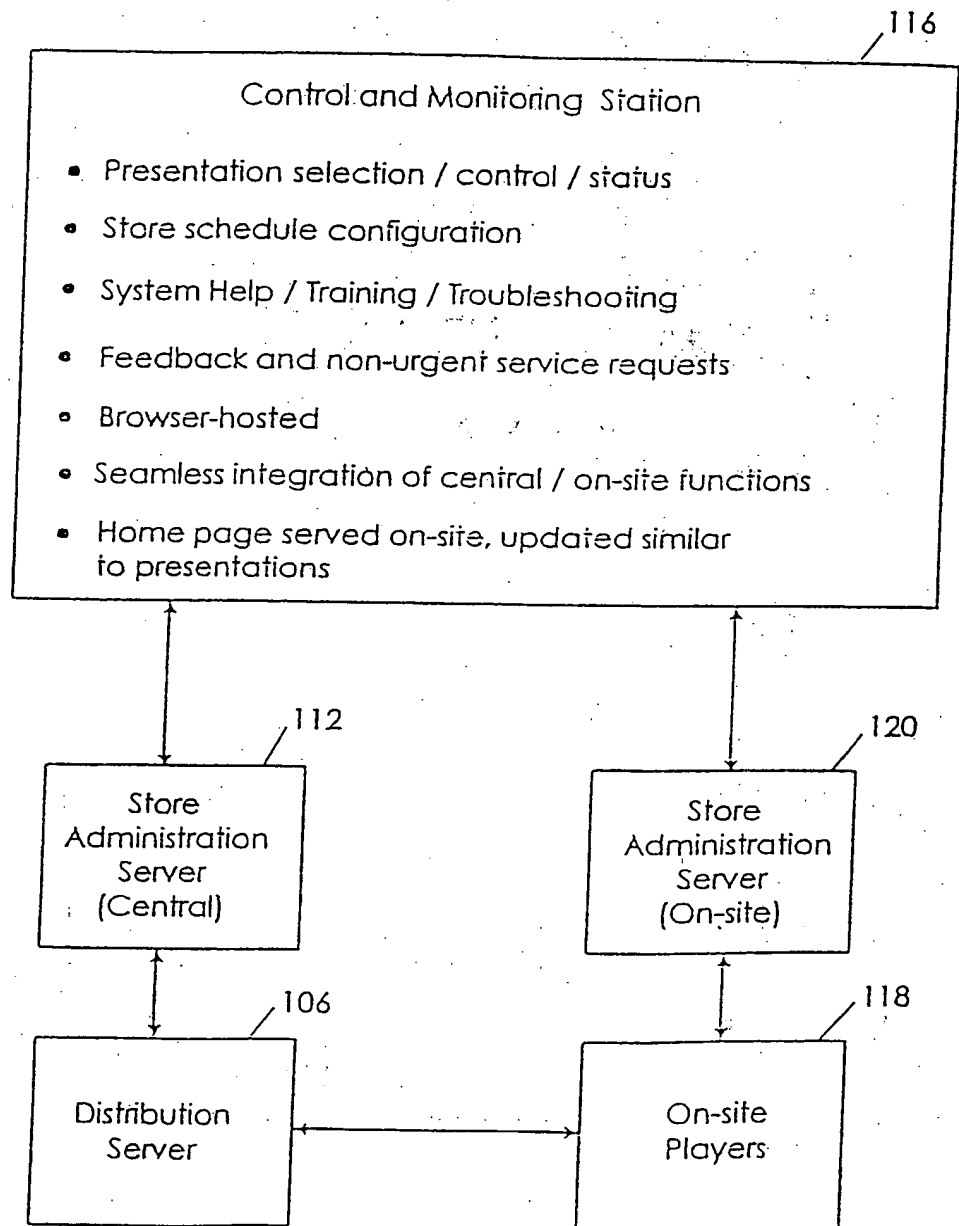


FIG. 9

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FIG. 10



SUBSTITUTE SHEET (RULE 26)



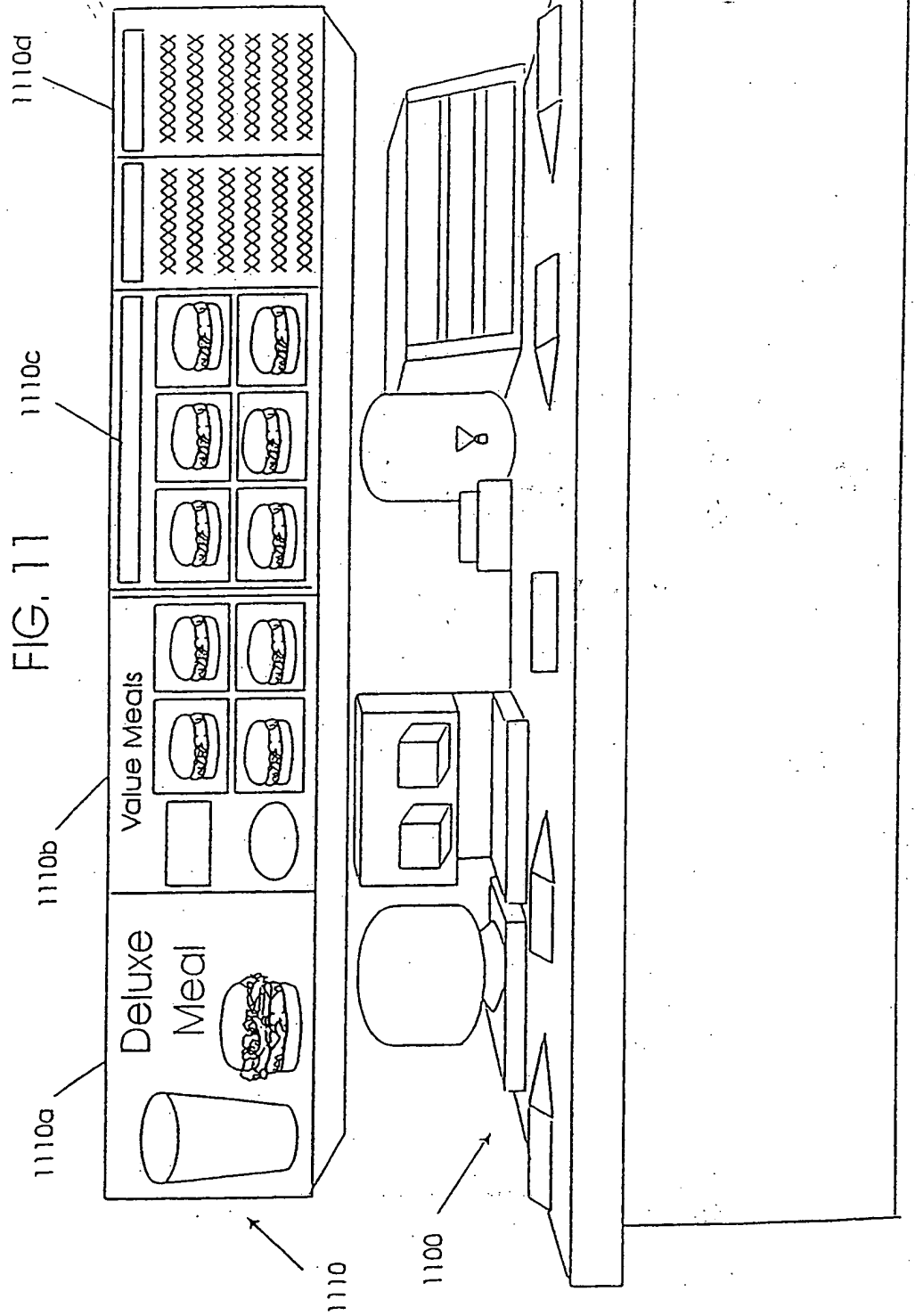
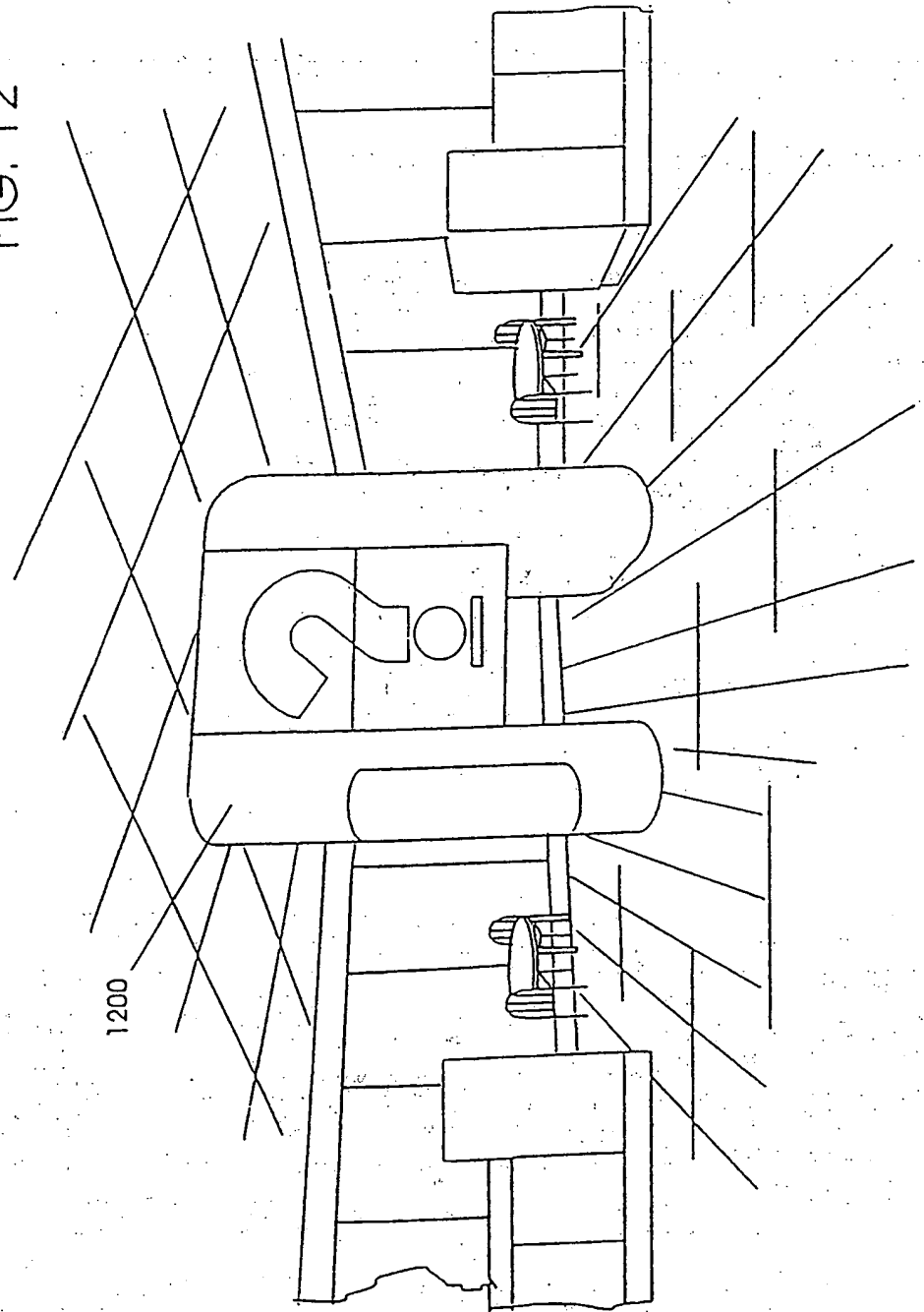


FIG. 12



## INTERNATIONAL SEARCH REPORT

Int. Jonal Application No

PCT/US 98/00513

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 G06F17/30

According to International Patent Classification(IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 G06F H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 96 08113 A (BYLON CO LTD ;CHO NACK Y (US); MAGILTON JERRY E JR (US)) 14 March 1996 cited in the application see claims 18-27 see page 4, line 1 - line 13 see page 5, line 3 - line 11 see page 7, line 26 - line 36 see page 15, line 20 - page 17, line 30	1-67
Y	FR 2 596 605 A (VANDAMME JACQUES) 2 October 1987 see page 5, line 14 - page 6, line 37 see page 8, line 19 - page 8, line 29	1-67

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"A" document member of the same patent family

Date of the actual completion of the international search

12 May 1998

Date of mailing of the international search report

20/05/1998

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Authorized officer

Gardiner, A

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/00513

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9608113 A	14-03-96	US 5566353 A AU 3508995 A GB 2307820 A	15-10-96 27-03-96 04-06-97
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